

18,000 REVOLUTIONS A MINUTE.

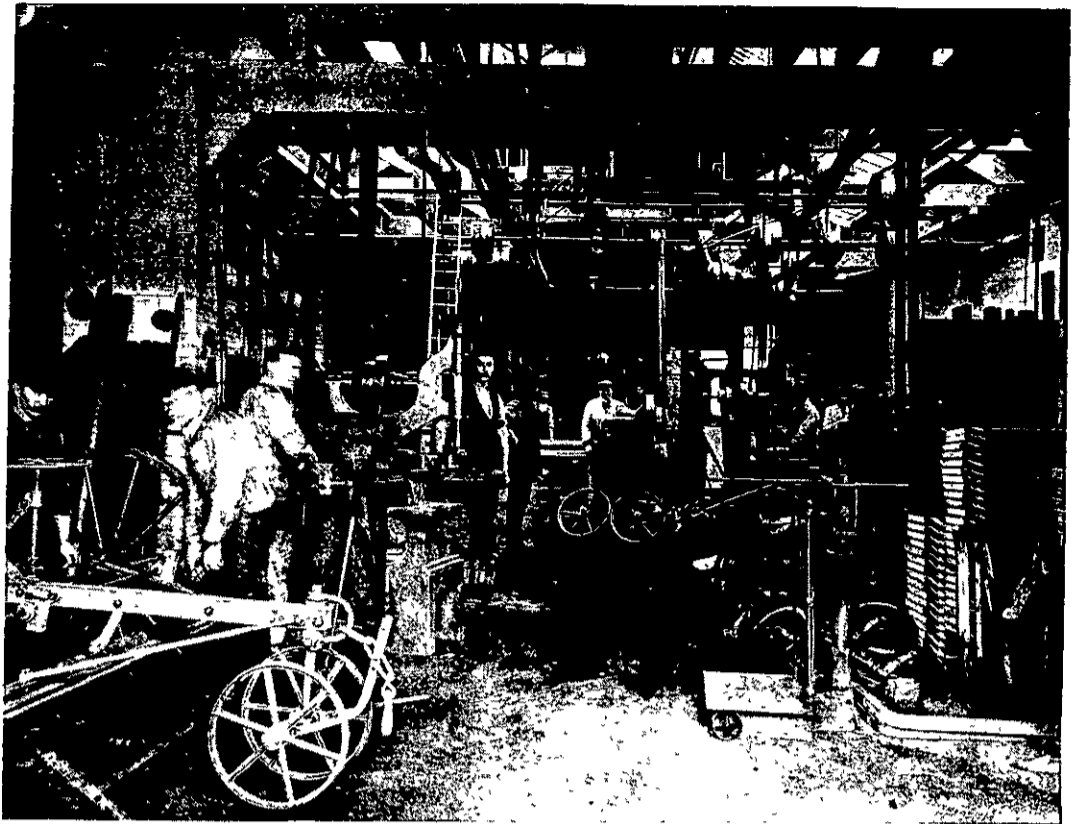
In the Bliss-Leavitt torpedo the gyrostat principle is also used to control the steering, but there is no spring to start the revolving disc or wheel. The disc is hollow, and has a number of small nozzles opening from its circumference, each nozzle being at the end of a tube which projects like the spokes of a wheel, but in the line of tangent to the circumference, or forming a right angle with the radius. Compressed air passes into the interior of the disc and escapes in jets from the nozzles, and the result is that the disc is driven round in the reverse direction to the escape of the air. It is claimed that its velocity rises to 18,000 revolutions per minute. The device may be called a turbine-gyrostat, and will doubtless have other useful applications found for it. Driven at this high speed the revolving disc would require an enormous force to divert it from its original course.

After prolonged tests at Newport News, carried out so secretly that even the ubiquitous Yankee reporter heard nothing of them, the United States Navy adopted the Bliss-Leavitt as its service torpedo. Two hundred are now being manufactured, half of them of the 18in. diameter type, and the rest of 21in. diameter. The largest torpedoes in our navy are the 18in. Whiteheads. The 21in. Bliss-Leavitt carrying an increased charge of guncotton, will be the most powerful torpedo in any navy. Its guaranteed range is 3,500 yards, but it has been run over 4,000 in the test trials. The only torpedoes above 18in. in diameter that have yet been made anywhere were a set of ten 24in. Whiteheads manufactured for the Japanese Government just before the war. But it is believed that these were intended to be discharged from tubes mounted on land in connection with the defences at the narrow entrance to the Island Sea. The 21in. Bliss-Leavitt is apparently intended for use on shipboard. As no naval Power will allow another to get ahead of it in armaments we may be sure that we shall soon hear of an increase in the size of the Whitehead in European navies, even if they do not follow the example of the United States and try to obtain a weapon like the Bliss-Leavitt.

ELECTRICITY'S TRIUMPHS.

WONDERS OF MODERN INVENTIONS

At one time the clank and rattle of mechanism amidst a sustained whirring of wheels was what one always heard when visiting a manufactory or a power station. Those were the days when the steam king reigned without a rival; but times have changed. Now the triumph of the blue king—electricity—has reduced motive sound to a minimum, and the giant steam machines are falling into disuse through the advent of a cleaner and more compact method of generating power. This fact was impressed upon a *Post* reporter during a visit to the electrical power house of the Well-



P. AND D. DUNCAN'S WORKS: ERECTING SHOP.

ton City Corporation, wherein is generated the propelling power for the city and suburban trams, and the lighting and power supply of a few outside institutions.

It is a system of delicately controlled gigantic forces, with electricity the king installed supreme and served by steam the satrap. The steam which drives the electrical engines is supplied from boilers to which are fitted the Erith stokers—a mechanical contrivance which feeds coal into the retort fires as required in regulated quantities, and thus entirely obviates the making of smoke, as the gases are consumed in a clear fire immediate they are generated. The system in force at the power house is for the most part self-controlled, and at every turn the triumph of man's mind over seeming impossibilities is apparent.

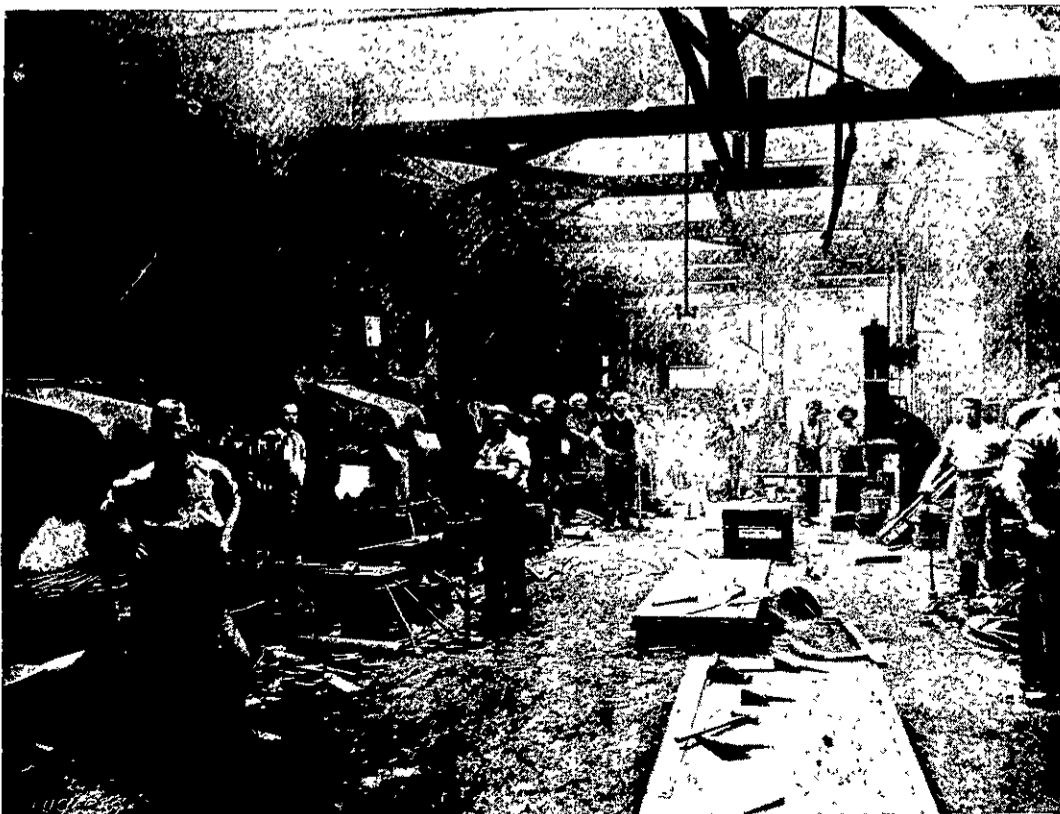
The chief engineer of the works (Mr. Peter M'Coll) has an office on the top floor, surrounded by a platform from which he has immediate oversight of the whole works. There are three engines in operation, aggregating 1750 h.p., and a huge Belliss and Morcom engine, of 1000 h.p., is now completed. When this latter work is completed the Council will be able to supply electric lighting to all who desire it. The power house has been built with a view to extension, and it is up-to-date in every respect. Labour-saving and energy-

saving devices are everywhere apparent. Even the clinkers from the fires are utilised by being ground up to make bedding for pavement flags; in short, nothing goes to waste. The water for the boilers is heated in "economisers," which raise its temperature 240 and 280 degrees before it is run into the boilers, and the heat with which this is done is secured without additional cost to the running expenses. There is method in everything. Each gallon of water that passes through the works is mechanically measured and recorded, and there are checks upon coal consumption in relation to steam generation, which enable the engineer to ascertain from day to day what has been the cost and whether the quality of the coal supplied is up to the average.

Method is applied down to the merest detail. A bell sounded as the reporter was making the rounds. "That is an alarm to let us know that a big storage tank on the roof of the building is full of salt water for the engines," Mr. M'Coll explained. "If there was too little water an alarm would also be given," he concluded.

The switchboard of the establishment is a huge one, beautifully kept and on a floor below it the electric motors are in constant action. These are run at a pressure of 550 volts, and there is an arrangement which practically prevents any waste of power. When the trams are running at normal speed and in normal number the strain shows but slight variation. But occasionally it happens that a large number of trams are starting together, and perhaps some "steep pinches" are being travelled at the same time. Then there is a demand for greater power. This is provided through the action of what is known as a variable expansion lever, which works automatically. When the strain comes the lever moves rapidly over, and by so doing sets up a stronger current to meet the increased demand. As the demand relaxes the variable expansion mechanism automatically swings back to the normal, decreasing the energy supply accordingly.

The engines at present installed have occasionally to work to their utmost capacity, there being the lighting of the Town Hall and the supply of light to firms to be kept going, in addition to the trams. There is a special machine used for the Town Hall and private lighting supplies. An interesting invention that is installed at the power house is known as a "negative booster." It is an electrical pump which sucks the current through the rails back to the negative side of the machine, working on the car-shed return current. This information as to the scope of a "booster" should fill a long-felt want, for when it was recently noted that the City Council had ordered a "booster" for the Brooklyn tramway one "Constant Reader" wrote to ask if it was "something to boost up the receipts from the line." He was close to the truth, for the saving effected by conservation of the electric current materially affects the relative average of receipts and expenditure. A number of "boosters" are now on the way to Wellington to be installed on the suburban lines. Another improvement in conditions is being effected by



P. AND D. DUNCAN'S WORKS: BLACKSMITHS' SHOP.