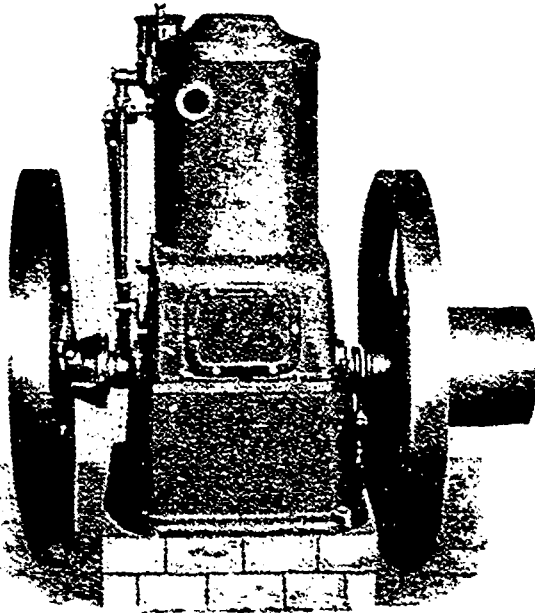


### IMPERIAL GAS AND GASOLINE ENGINES.

The 'Imperial' gas and gasoline engine, while containing nothing that may be termed radical in good gas engine practice, embodies several improvements in details and design that will prove interesting to our readers. The vertical design has been adopted as being more compact and pleasing in appearance than the usual horizontal type. Fig. 1 shows the general appearance of the engine in all sizes. The pump used to supply the gasoline to the sight feed cup is shown in its position, bolted to the side of the engine frame, and also the shaft governor, which is simple in design, and acts positively on the governor valve. The governor embodies some new features from the fact that it does away entirely with the "hit and miss" plan on which many gas engine governors work. The "Imperial" works on the "Otto" cycle, and the governor supplies the cylinder with a charge every other stroke, which is graduated to the work being done, and the piston receives an impulse of greater or less effect accordingly. This feature makes it especially adapted for electric lighting purposes.

The gasoline pump and the governor are the only parts working outside the engine frame. By referring to Fig. 2 it will be seen that the gearing, valve cams, and shaft for imparting motion to the igniter are all enclosed and dust proof, though readily got at by removing the side plates on the frame. The crank dips into an oil chamber at each stroke and throws the oil in a fine spray into the cylinder and over all the working parts, from which it drips back into the chamber to be used again. After four months' usage an engine was taken apart for examination, which showed that every part had been well lubricated. The engine is built with either the tube or electric igniter, but the electric igniter is preferred. Motion is received from a shaft connected to the gearing and imparted to the electrode of the igniter by a crank and arm motion which gives a wiping spark above and below a small wire electrode, which has a long life and can be readily renewed. The vaporizer for the gasoline is situated inside the frame, and does away altogether with the use of a carburetter. No explosive mixture is made until the downward motion of the piston draws a supply of air through the inlet valve, and as the air must pass through the vaporizer to enter the valve, it converts the gasoline on its way, and leaves no mixture



IMPERIAL GAS ENGINE FIG. 1

within the engine frame. This system does away altogether with any semblance of danger in the use of gasoline, and is a great improvement in that respect. With the use of the electric igniter there is no delay in the starting of the engine, and in regular practice the time needed is less than one minute. A novice can start

them quite easily, and the simplicity of the entire outfit makes it a desirable outfit for any purpose where power is required. Villages and towns, summer resorts and large factories, public buildings etc., find it an efficient means of producing power for a combined electric lighting and pumping plant. For a pumping plant, a plant

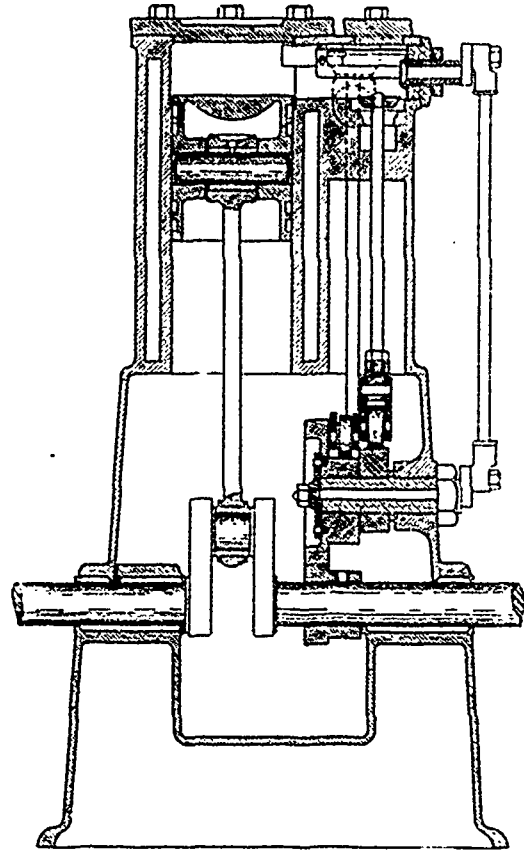


FIG. 2.

of this kind can be used during the day for supplying water for domestic purposes, and at night can be started full power at a minute's notice for fire protection. Where city gas, natural gas, or producer gas of any kind can be had, the engine can as readily be operated as with the gasoline.

The Cooper Machine Works, 128 Adelaide Street East, Toronto, are the builders of the "Imperial" engine, and will build it in all sizes, and intend devoting their entire time to the manufacture of gas, gasoline and oil engines for all purposes, stationary, marine and portable. They will also build suitable motors for horseless vehicles.

CAPTAIN ALFRED T. MAHAN writes a fourth and final article on Nelson's engagements for the *Century*, "Nelson at Trafalgar" appearing in the March number. Captain Mahan relates the following anecdote of the great admiral: The admiral in person, accompanied by the train of frigate captains, inspected the 'Victory' and her preparations throughout all decks, ample time for the tour being permitted by the slowness of the advance. At 11 a.m. he was in his cabin, where the signal-lieutenant, entering to prefer a request of a personal nature, found him upon his knees writing, and it is believed that the following words with which his private diary closes, were then penned: "May the great God whom I worship grant to my country, and for the benefit of Europe in general, a great and glorious victory; and may no misconduct in any one tarnish it, and may humanity after victory be the predominant feature in the British fleet. For myself individually, I commit my life to Him who made me; and may His blessing light upon my endeavors for serving my country faithfully. To Him I resign myself and the just cause which is entrusted to me to defend. Amen, amen, amen."