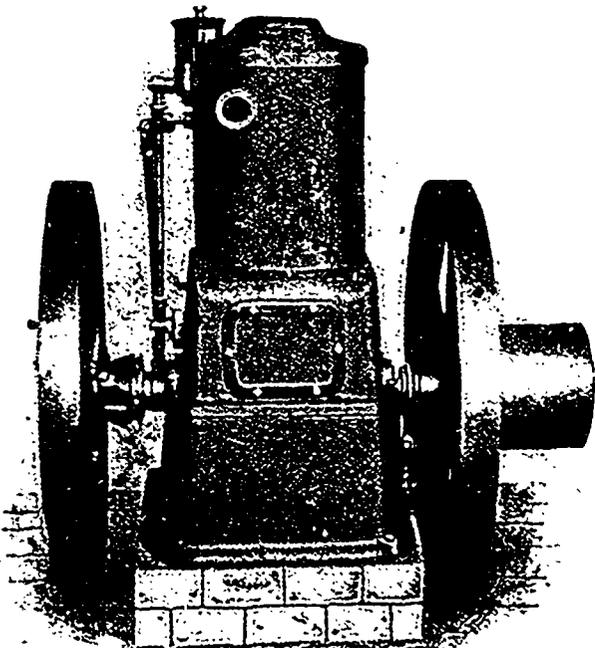


he was called to Blackheath, near Hamilton, Ont., where he is now in charge of the Presbyterian church. In the quiet life of his village home Mr. Marsh found time to pursue his favorite studies in the theories of light, heat and sound, and before his stethophone was invented he constructed a "talking machine" which is capable of repeating sounds with many times the force of the machines used at entertainments. The stethophone described in the preceding article was suggested to Mr. Marsh one day by his calling to his little girl through a window, and conceiving of the window-pane as a diaphragm, he immediately set to work on experiments that resulted in the invention, which must completely supersede the stethoscope in medical examinations. In putting his invention before the world, Mr. Marsh has begun in the right way by applying to his invention a name which really describes the apparatus. The Greek words which form the term stethophone mean to "see the breast," whereas the instrument only enables one to hear the sounds of the human chest. Mr. Marsh's term, stethophone, which, by the way, is registered under the Trade Marks Act, is truly descriptive of his invention, and deserves to come into use, if it were only to do away with the old misnomer. But the new stethophone is as much superior to the stethoscope in efficiency as it is in name.

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



IMPERIAL GAS ENGINE, FIG. 1.

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 im-

parted 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

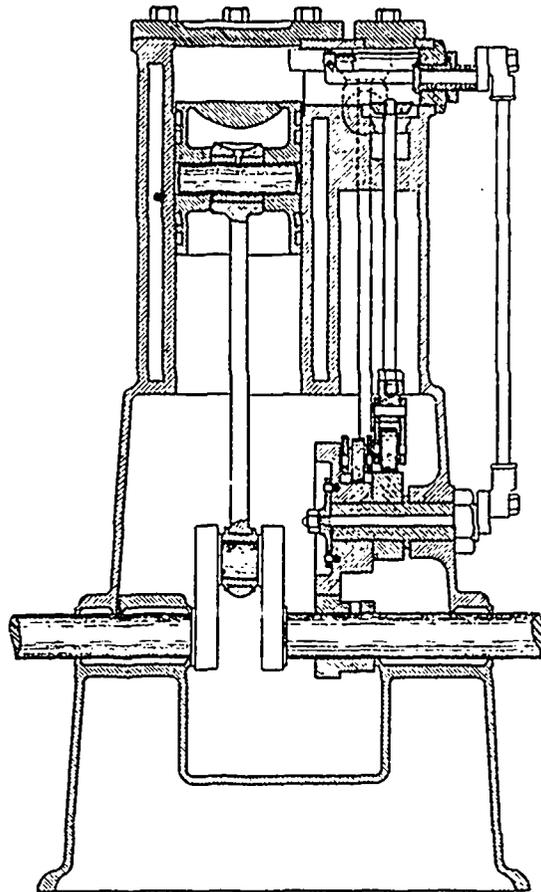


FIG. 11.

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 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 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.

THE CANADIAN ASSOCIATION OF STATIONARY ENGINEERS.

On Feb. 3rd, Toronto Branch No. 1 held their second annual At Home in their hall, 61 Victoria street, which consisted of a concert, followed by a dance and refreshments.

On Feb. 8th there was a meeting of Kingston No. 10. F. Simmonds occupied the chair. A paper, which was read in the Montreal association, was read by J. Turnbull. It was entitled, "Heat and the Action of Steam during a Boiler Explosion." This paper was discussed by those present, after which C. Asselstine, read a paper entitled, "The Engineer of the Past and Present." It was decided to hold an open meeting Feb. 22nd.

Hamilton No. 2 held an open meeting of instruction, Feb. 19th, in the K.O.T.M. Hall. Lectures were delivered by Mr. Norris and Mr. Ballard, inspector of public schools, who kindly consented to be present.