

tricity. Power is supplied by a one horse-power, 500-volt motor from the Ottawa Electric Company's service.

The tools consist of a 12-inch Star lathe, made by the Seneca Falls people, a 6 by 8-inch Worcester shaper, a Champion Forge and Blower Company's drill of one and one half inch capacity, an emery grinder and a small air compressing plant of his own construction.

The outfit of small tools is very complete and kept in first-class order. The drills, reamers, mandrels, taps, dies, calipers, gauges, rules, levels, clamps, and dogs are all kept in properly arranged cases and racks.

A complete inventory is kept and breakages are replaced as made. The chief breakages occur with small drills and taps, but these accidents are wonderfully few. The owner has found that the self-hardening tools are by far the best for the amateur, and so has a complete set of Armstrong tools of the required sizes.

Since the time of the amateur is limited it does not pay to be continually re forging tools except for some special purpose.

Dr. McElhinney has built a number of small machines, including dynamos, motors, water-wheels, small lathes, steam and gasoline engines, besides many smaller jobs of various kinds.

He has also made a number of instruments and appliances relating to his profession, that of dentistry, and several scientific instruments, the last of which was a micro-photographic apparatus.

Fig. 1 shows a 9-inch Star lathe, which has since been replaced by a 12-inch of the same make. It has the pan and simple and compound rests.

Fig. 2 shows a 2½ by 3-inch twin marine engine with piston valves and loose eccentrics, and Fig. 3 shows a 3¾ by 4½-inch marine engine, which he used for two years in his launch. He also built the boiler, which is a water-tube of the Salamandrine type.

This outfit he replaced last spring by a 4¾ by 4½-inch two-cycle gasoline motor and evidences show that he has deserted the army of steam-users for the more convenient

larger gasoline engine, and shows a suspicious interest in books and catalogues pertaining to automobiles.

Dr. McElhinney's father, Capt. Mark P. McElhinney, is a member of the American Society of Marine Architects, and is Nautical Advisor to the Department of Marine at Ottawa. He was a pioneer in the designing of the ice-breaker type of

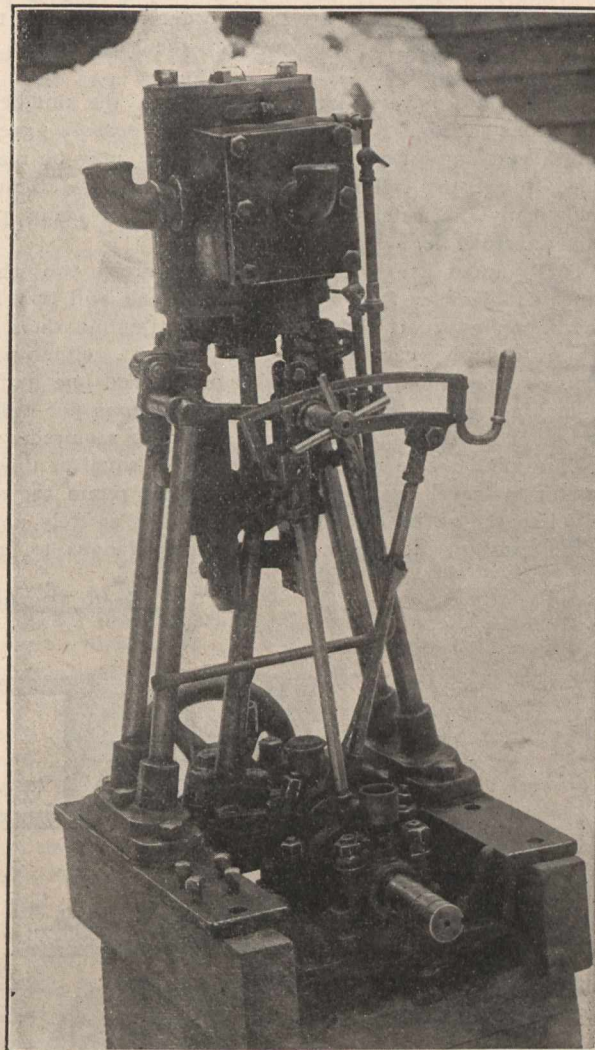


Fig. 3.

steamship. The Canadian Government steamers "Stanley" and "Minto" being from his designs. Since the doctor as a boy spent considerable time on board ship, and has lived all his life in a nautical atmosphere his love for machinery and marine engines in particular is not to be wondered at.

#### GREAT GAIN IN CAR AND LOCOMOTIVE CAPACITIES

H. J. Small, general superintendent of motive power of the Southern Pacific Railroad, has compiled data showing the great increase and size and capacity of the locomotives and cars of that road. In 30 years the standard locomotive of the Southern Pacific Company's lines has increased in weight from 30,000 to 280,000 lb. The tractive power has increased in the same time from 11,600 lb. to 43,305 lb., the latter figure representing the capacity of the heavy consolidated type of engine. Comparisons between the freight car standards of 1888 and those of the present show an increase in weight of freight cars from 22,000 to 42,000 lb. The capacity has increased from 30,000 to 100,000 lb. In length the freight car has grown from 27 feet to 40 feet. Passenger car capacities have shown a marked increase also, the statement being made that in 25 years coaches have been widened two feet and lengthened 26 feet, the seating capacity increasing from 32 to 70. The height of passenger coaches on the Harriman lines has increased in 25 years from 10 feet 9 inches to 14 feet 2 inches, and the weight of coaches has been multiplied by four. While the numerical increase in railroad cars in the United States has been very great, it will be seen that the increase in total capacity is relatively much greater.

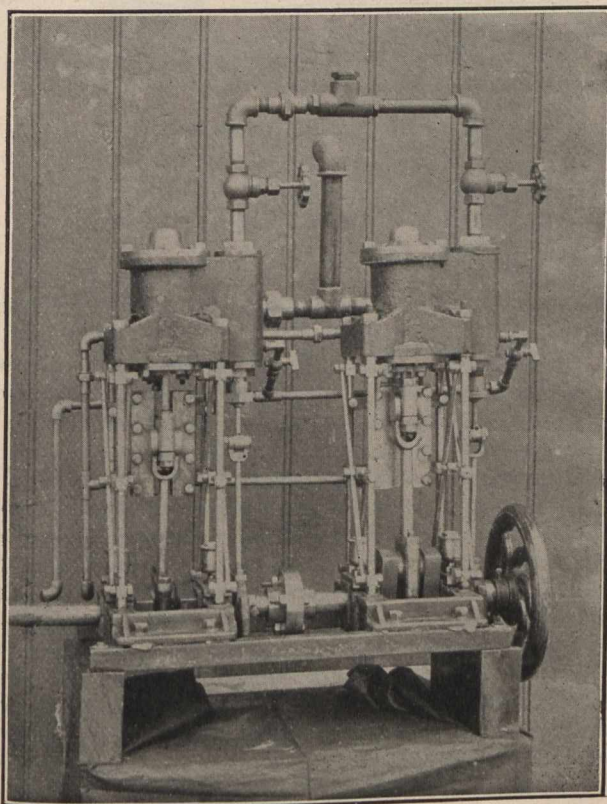


Fig. 2.

Power. He certainly has few of the usual troubles with his gas engine which is probably due to the fact that he built it himself and knows how to run it. He also uses a motor-cycle, and has been heard to say that a man that can run a cycle, and has been heard to say that a man that can run anything motor-cycle successfully ought to be able to run anything short of the universe itself. At present he is building a