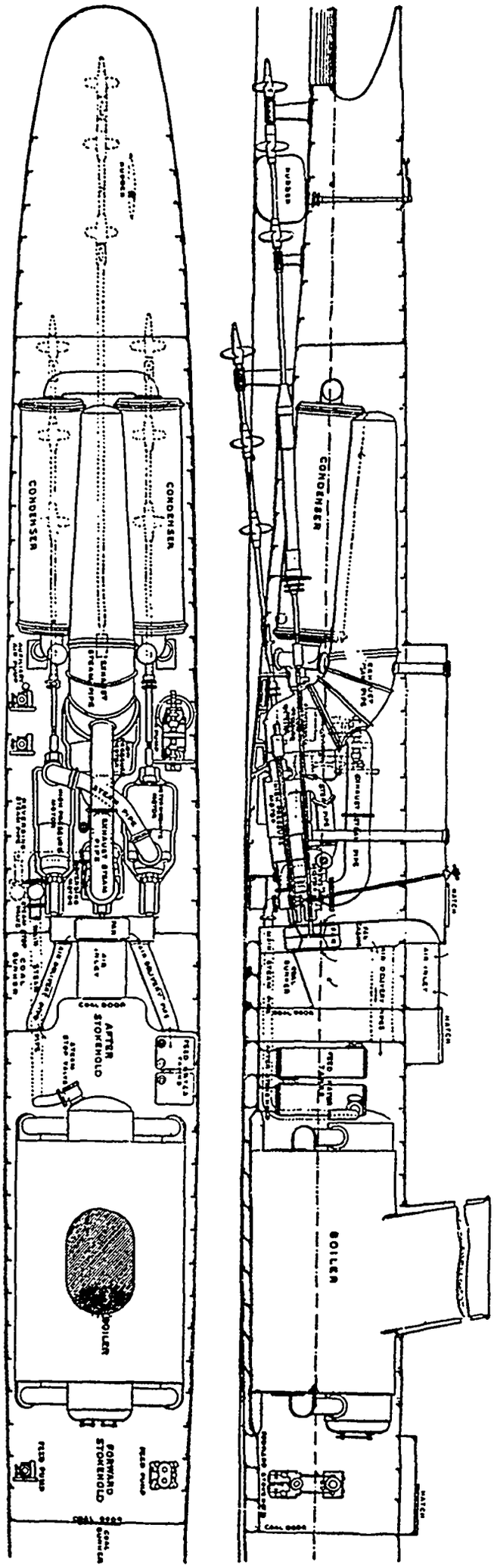

construction, and that the power delivered by the motor at a high speed of rotation can be economically transformed into thrusting power by the screw propeller, and that the whole of the machinery is simple and easy to work, the position of the rotary-motor becomes well established as a rival of the reciprocating engine, provided there are no drawbacks to detract from the advantages which it manifestly possesses. Up to the present no such drawbacks have shown themselves, or seem likely to."

"The 'Turbinia,'" says *Engineering*, of London, "which, at the special request of the admiral in command of the fleet, made a run at full speed through the lines at the great naval review, is so novel a vessel that in spite of the remarkably successful results achieved by her, it would be difficult to say to what she will lead. Certainly it is a very long step forward to imagine steam turbines taking the place of the ordinary reciprocating engine in heavy vessels. But if the difficulty at present attendant on going astern can be overcome, it can hardly be doubted that for very high-speed craft the new system will find a conspicuous place in warship design, in spite of the multiple screws and the high rate of turning."

New principles, whose application seems likely to have such great influence in the future development of naval architecture, have not escaped the notice of the leading shipbuilders and owners of Canada. The Richelieu and Ontario Navigation Co., as noted in THE CANADIAN ENGINEER recently, has during the past couple of months examined the Turbinia model, with a view to its possible adoption for their new steamers.

INSTRUCTION IN PRACTICAL SCIENCE.

Discoveries made in the past ten years have materially changed the problems which civil engineers are required to solve and changed problems demand enlarged equipment for their solution. The department of the waterworks engineer has been most materially affected by recent discoveries. Formerly water supplies and sewage works were matters of construction and hydraulics. The water supply was obtained as pure as possible, and pains were taken to maintain that purity. The sewage was filthy and its condition was a hopeless matter—it was "disposed of" in "disposal" works or poured out to contaminate the water supplies of other places.

It is now established as a fact by scientific research that the dangerous elements of impure water and sewage are largely the same, are caused in fact by the presence of certain bacteria. These bacteria cannot continue to exist in the presence of certain other classes of bacteria, and the problem of water purification to-day is solved by the most advantageous bringing together of these various classes of bacteria.

It does not ordinarily lie within the sphere of the duties of a civil engineer to make cultures of bacilli, but if his practice is to include public water supplies and sewage works, he should possess sufficient knowledge of the general principles of biology and enough of bacteriology to know what should be done to determine the sanitary condition of the water he is dealing with and the effluent from his sewage disposal works. In order that a civil engineer shall be professionally qualified either to design some modern water supply and sewage-disposal works, or to maintain and operate them, it is absolutely essential that he should have suitable biological training in the school of civil engineering. How many of the civil engineers who have been instructed in our expensively equipped schools of science have ever heard of the bacteria of putrefaction, or who would know a microbe if they saw it with the aid of