"Surprise Ships" May Change Fashions

Naval Architecture

The new high-efficiency German warships of the "Ersatz-Preussen" class, whose appearance has caused a good deal of a buzz in European naval circles, may force some radical changes in battleship and cruiser fashions. Medium-sized, fast ships armed with 12-inch guns, favorite caliber of pre-war days, may replace some of the huge floating fortresses like the "Nelson" and the "Maryland," with their 16-inch armaments.

This possibility is discussed by the editor of *The Engineer,* leading British technical publication. The German ships, with their 26-knot speed, can easily run away from any existing ships big enough to sink them, except for four big battle cruisers in the British Navy and four in the Japanese. Other navies have plenty of cruisers fast enough to overtake the German ships, but the 11-inch guns carried by the latter would make such a proceeding suicidal. Therefore, the Continental admiralties, especially the French, are considering whether it would not be wise to meet this new type of construction with a "medium-sized battle-cruiser" of about 17,500 tons, armed with guns of 12-inch caliber. There were battle-cruisers of this general description in the British navy before and during the war, but they were scrapped in accordance with the Washington treaty.

The editor of *The Engineer* is even inclined to back the smaller caliber gun against the 15- and 16-inch monsters as practical weapons under ordinary conditions of sea fighting.

"We are often invited to consider the tremendous effect of a well-aimed salvo from the 16-inch guns of the 'Nelson', each of the projectiles weighing roughly a ton," he comments. "Without doubt, a direct hit by even one of these levin-bolts would prove very destructive, but would it do more damage than the impact of two 13.5-inch or three 12-inch shells? War experience suggests a negative answer. If that be so, a strong case could be presented for the smaller gun, which could probably fire twice as rapidly as the 16-inch. In other words, a vessel training ten 12-inch guns on the broadside would be able, within a given period, to deliver a volume of fire but little inferior in weight to that of a vessel with nine 16-inch guns, and, other things being equal, the more numerous guns would register more hits."

It is not expected that naval construction in the United States will be seriously affected by the new proposals in Europe. American designers have always tended to mount the largest number of heavy-caliber guns compatible with efficiency in other directions. But the editor argues against following the American example in this.

"There is good evidence that the American replacement ships planned for 1931 will be designed up to the Treaty maximum of 35,000 tons and mount ten 16-inch guns. The appearance of such mastodons would doubtless provide a strong, if superficial argument for the building of similar ships for the British Navy. We hope, however, that our naval directors will take a broader view, and not allow themselves to be drawn into a tonnage and gun-power competition which bears no actual relation to British requirements."

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Radium Reduces Fire Risk

Physics

Radium now fights fires by snuffing out dangerous sparks of static electricity in a large Russian rubber factory. So little radium is used that the method costs only a few dollars per year.

When rubber solution is flowed upon a fabric base and dries upon it, enormous charges of static electricity are produced from friction of the rubber-covered fabric against parts of the drying machinery. In time the pressure of these accumulated charges is raised so much that a breakdown through a discharge becomes inevitable. The hot, fat spark, exactly like the ignition spark in an automobile motor, presents a great fire hazard. Air in the drying room of a rubber factory is always saturated with highly explosive vapors, which ignite most readily.

The usual method of fire prevention consists of leading the charges of electricity away before their pressure becomes too high. A fine wire-brush is used to collect the charges. Small sparks cannot be avoided in this way, however, and the fire danger is always present.

All this is changed when radium is placed near the point where electricity is generated. Radium rays ionize the air and make it a good conductor of electricity. The dangerous charges then flow harmlessly through the air to the nearest metallic part and thence to earth. No sparks can be produced, when radium is on sentry duty. The new method was tried out in the Russian State Rubber Factory "Treugolnik" at Leningrad and was found to be successful.

The cost of installation is reported to be very low, as one milligram of radium is quite sufficient to produce the desired results. Furthermore, it will not be necessary to renew the radium capsule, as it will last for a few centuries at least.

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In a list of 13,500 American scientists, more than one-fifth are chemists.

New Zealand has a suicide rate considerably higher than that in Great Britain.

Toy Train Obeys Voice

Electrical Engineering

A toy electric train that obeys the spoken words of its master to go, stop or back, is one of the latest achievements of the General Electric Company's Research Laboratory.

The locomotive is named Casey Jones, and by saying "Go ahead, Casey," the train starts. "Stop" brings it to an immediate halt, while "Back up!" causes it to do just that.

The secret of operation lies in a special selector, connected through a vacuum tube to an ordinary telephone transmitter through which the orders are given. This determines the polarity of the rails in the track, and the polarity in turn determines whether the train goes forward or backward. Three or more syllables operate the relay and the selector to provide forward movement. A two syllable order reverses the polarity and the train, while one syllable breaks the circuit.

Future applications of the device are seen in elevator controls, that will respond to the spoken word, or a furnace door that will open or shut in response to spoken commands over a telephone at the bedside.

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