

Engineering and Motoring

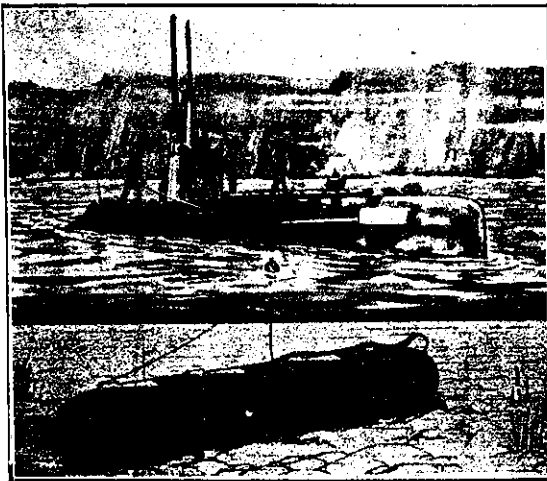
By Robt. Whitson, Engineer

German Submarines

How they keep at Sea

SUBMERSIBLE OIL TANKS

The ability of the German submarines to keep at sea for indefinite periods when hundreds of miles from any German naval base has been one of the surprises of the war. It is now suggested that the Germans may have established secret submarine bases consisting of submersible oil tanks at unfrequented points



The Submarine Oil Tank sunk to the bottom and marked by a buoy. It is raised to the surface by pumping air into the ballast compartments.

along the Norwegian coast and among the islands at the west and north of Scotland, and that the enormous supplies of oil required for the operation of these vessels is obtained from this source. This could be accomplished by means of a submersible tank that had already been invented for commercial purposes before the war began. This tank is cylindrical, is 150 ft. long and 30 ft. in diameter, and has an oil capacity of 2,280 tons. It is divided into four or more compartments which can be used for various grades of oil and can be emptied separately or together. Each end of the tank is divided vertically into two compartments, the upper compartment being utilized as a pump house and the lower as a ballast or trimming tank. With these trimming tanks, which can be filled with sea water or emptied by means of electric pumps, the cylinder can be floated or submerged, or can be made to float at an angle with the pump house at one end above water. An electrical oil pump capable of dis-

charging 100 tons an hour forms part of the equipment. When a submarine or other vessel is to replenish its bunkers it comes alongside, couples its electric cables to the pumps in the valve house and pumps out the required supply of oil, after which the tank is sunk to the depth required for concealment. The same process is followed by a vessel replenishing the supply of oil in the tank. When the tank is to be sunk to the bottom of the anchorage the electric cable and supply pipe are buoyed. The tank is securely anchored in case it is left floating.

The Making of Munitions

Dominion Help

The very real difficulties that have to be overcome by the Minister in charge of munitions before the Dominion can contribute in actual war material are not generally realized by the public. Doubtless it is comforting for the layman to know that activities in this direction are in hand, but, being a layman and understanding none of the technical and practical difficulties to be met, he will of course be the first to complain that nothing is being done.

The difficulties are not unsurpassable, but the successful tackling of their combination will surely call forth the exercise of much skill and organization before our help from the Dominion can be appreciably felt. Very few parts of the world could start out in a plucky and earnest endeavour to supply munitions under a worse set of conditions than those existing here, and may all credit accrue to those who have set out to, and undoubtedly will, "deliver the goods" in course of time. Our very distance from the scene of turmoil, which in the immediate present makes for our safety and comparatively uninterrupted course of routine living, is one of our greatest disabilities.

Three points really summarise the obstacles to be overcome—material, labour, and cost of production. Raw material is at the outset a tremendous handicap. Practically every item for manufacture will have to be imported, and where at the present time can the Dominion turn for supplies, when every world market is strained to its fullest capacity to supply those manufacturing centres nearer the scene of operations? Engineers throughout the whole Dominion are at present in bad trouble from lack of ordinary material with which to carry on, although no very particular demand has been made on ordinary lines.

The labour question fortunately need not be considered in the Dominion from the point of view of