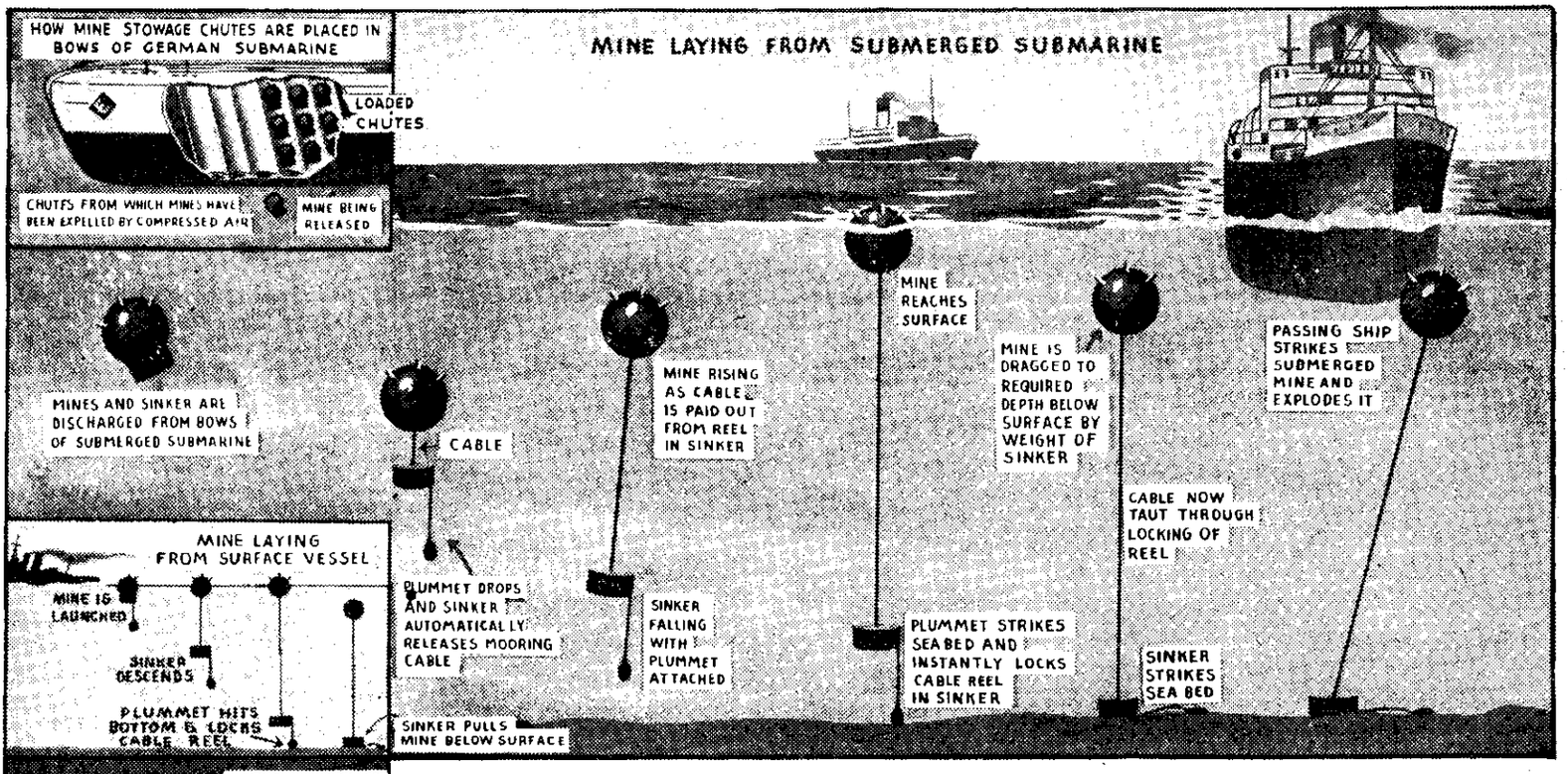


MINES AND MINE-SWEEPING

ALTHOUGH the full force of the mine menace has been overcome, ships are still falling victim to these under-sea bombs which have been laid by the enemy over important ocean routes. The loss of the Niagara off the New Zealand coast shows how far the menace extends.

Under international law it is a crime to lay mines without notification. At the Hague Convention of 1907, the Germans, like all other powers, agreed to certain procedure if and when mines were laid. At that Convention it was agreed that mine fields were to be used only to protect harbours or to confine shipping to narrow free channels for the easier control of contraband. All neutral shipping was to be informed of the extent and exact position of any such mine-fields, and all mines were to be fitted with a device which would put them out of action if they broke adrift.

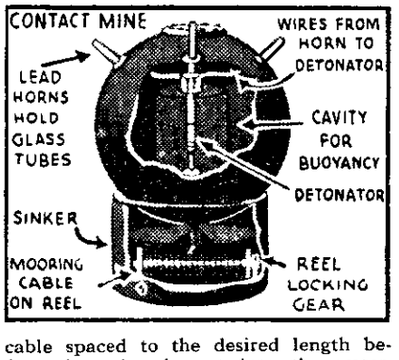
As with most, if not all, of her other agreements, Germany broke all international laws concerning mines in the last war and again in this one. This time Germany added a new terror by the use of the magnetic mine and also by laying floating mines without notification. The magnetic mine menace, after doing considerable damage in a short time, has been overcome by the "de-gaussing" girdle. Great quantities of moored and floating mines have been swept up, but it is not possible to prevent others from being laid by a variety of methods—by airplane, submarine. or minelayer. Now Britain has replied by using airplanes to lay a huge mine-field where it will hamper German shipping most successfully—in the Baltic Sea and off the Norwegian coast.

One of the most heroic branches of the Royal Navy is that of the mine sweepers—trawlers and fishing boats for the most part which, with the help of the paravane, an invention of the last war, keep our seaways clear. Every officer and man engaged in this duty lives in constant danger of his life.

Few people realise the size and destructive power of a mine; fewer still in this country have seen one. A mine, or under-sea bomb, is a huge cylindrical vessel containing a high explosive, a highly-developed apparatus for detonating that explosive and an air-chamber to keep the mine buoyant. An average mine weighs about 600 to 700 lbs. and is charged with about 350 lbs. of T.N.T. or some other equally powerful explosive. This is the ordinary moored mine, which is laid in deep-water channels. There are others—the magnetic mine, which is laid in shallow water, and the floating mine, which is laid anywhere and is carried about by wind and tide.

The air chamber occupies about half the total interior space of a mine. On the outside of the cylinder there are a number of lead horns, usually five or six, and in each of those horns there is a glass tube containing strong chemicals or acids. When a ship strikes against a moored or floating mine, the impact crumples at least one lead horn, possibly more, breaks the glass tube, thus allowing the chemical or acid to trickle down and contact a detonator which then fires the explosive.

Mines are now laid by airplane, as well as by minelayers or submarines. A minelayer usually disposes of about 200 mines on each trip, spacing them out unevenly over a given seaway. When an area is sown with mines the object is to keep them floating just underneath the level of the water so that they strike the flatter part of the ship's hull. In order to achieve this object each mine is attached to a sinker by a length of



cable spaced to the desired length before the mine is put into the water. When the sinker reaches the sea-bed, the force of impact releases an automatic device which pays out sufficient cable to allow the mine to rise until it is held beneath the surface of the water.

Floating mines are sometimes fitted with a hydrostatic control to keep them at the required depth below the surface, and are made so that the action of the seawater eats through the anchoring cable and releases them after the minelayer has passed out of danger. Such floating mines are less dangerous than the moored variety as the action of an approaching ship pushes them out of the way. British mines are fitted with a device which renders them useless if they break from their moorings.

Great numbers of trawlers, fitted as mine sweepers, are engaged in the hazardous task of destroying mines. These ships move singly or in groups, dragging wire cables which link the groups together. Each ship pushes a paravane in front of it through the water. When the paravanes or dragging wires come in contact with the cable which holds a moored mine they cut it as easily as cutting a thread with scissors. As the mine floats to the surface it is exploded by rifle fire from the deck of the sweepers. The paravane, an ingenious device, is rather like a steel fish and floats under water, with specially constructed fins to keep it streaming out from the side of the sweeper. The steel towline of the paravane is held in place by a projection on the bow of the ship.

Day and night the work of the mine-sweepers goes on. No sooner has one area been swept than the boats must go over it again, since more mines may have been laid by the Germans during the night. Several captured enemy submarines have been fitted with serrated bows, thus enabling them to cut through nets laid at strategic points such as the entrance to ports and protected areas.

During the last war British mine-sweepers swept up and destroyed 23,873 German mines. This bag was largely the result of the invention of the paravane. It may be remembered that in 1917, when the outlook for the Allies was blackest, 123 British merchant ships went to the bottom; by 1918 the losses had been reduced to ten ships.