

DEMOLITION OF TRIPOD SHEERS AT CHATHAM DOCKYARD

The 130-ton tripod sheers used for heavy lifts in No. 1 basin, H.M. Dockyard, Chatham, for 40 years, were successfully demolished on September 15th, 1945, in order to make room for more up-to-date lifting equipment. Demolition was accomplished by severing the back leg anchorage plates simultaneously by means of oxy-acetylene cutters and allowing the legs to fall into the basin. The legs floated and were subsequently towed into dock for cutting up.

The sheer legs were erected in 1904 and consisted of two front legs 160 ft. long, 50 ft. apart at ground level and of circular section having a diameter of 5 ft. 3 in. in the centre and 3 ft. at the ends. The rear leg which was 210 ft. long, was also of circular section, 6 ft. diameter in the centre and 3 ft. at the ends. The weight of each front leg was 40 tons and the rear leg 54 tons. Each leg had internal strengthening discs approximately 12 ft. apart; each disc having a man-hole to permit of internal survey being made throughout the whole leg. The lower ends of the front legs fitted into cast steel cup sockets and were held in position by steel keys; the spaces between the keys being filled with cement.

The sequence of operations commenced with the removal of all the main and auxiliary purchases and the top and bottom blocks. As much of the cement in the front leg sockets as was accessible was removed by chipping. The man-holes in the internal strengthening discs were sealed off and external access holes re-jointed in order to provide maximum flotation in the event of fracture. The sheers were then run out to the maximum overhang position (see Fig. 1),

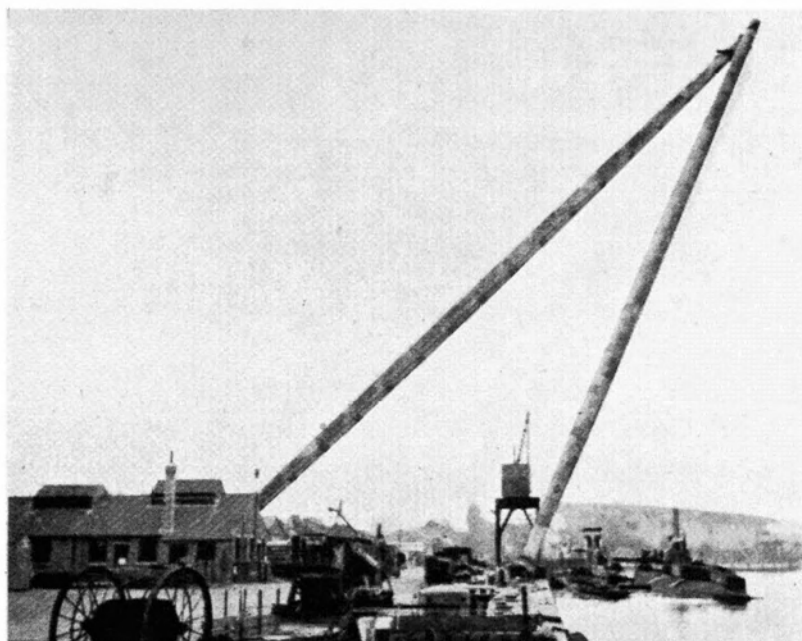
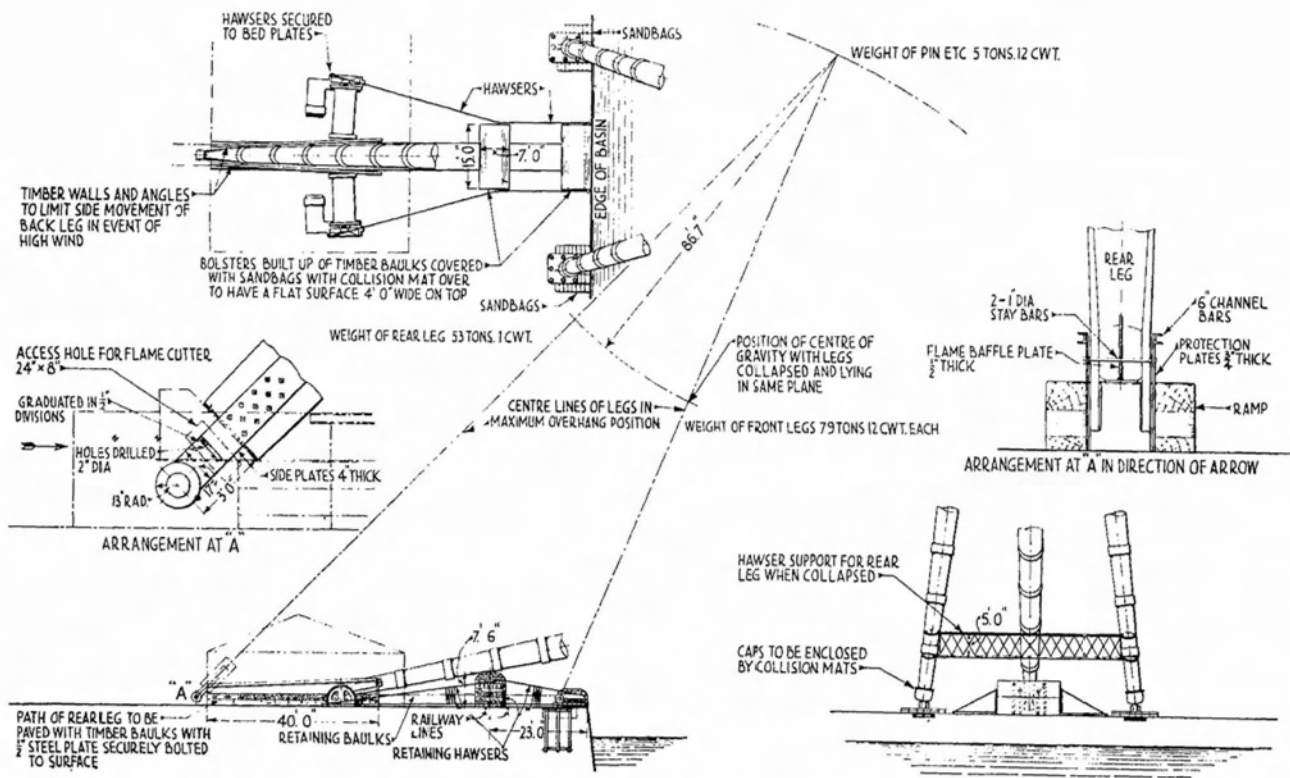


FIG. 1.—SHEERS IN MAXIMUM OVERHANG POSITION



ARRANGEMENT FOR DEMOLISHING OF SHEERS

the resultant C.G. of the structure being approximately 9 ft. 6 in. over the basin edge. As it was necessary for the whole site to be cleared after demolition, the machinery house, platforms, etc., were removed in addition to the winches and gearing in the path of the rear leg. The arrangements made for the demolition of the sheers are generally indicated in the drawing on page 42.

A steel faced timber slide was built for the rear leg path and arranged to ensure that the minimum "drop" occurred when the rear leg anchorages were severed. Guide walls were fitted to this slide in order to limit the possible side movement in the event of high winds (Fig. 2). Two timber ramps, surmounted by three layers of sandbags, were constructed and positioned so as to prevent damage to the basin wall. The ramp nearest the basin was 3 ft. high while the other, which was intended to take the first impact of the rear leg, was 7 ft. 6 in. in height. These ramps were anchored by steel hawsers to the main winch foundations (see Fig. 3).

As fracture of the cup socket rims was a possibility, these were enclosed by shot mats, to avoid accident by flying metal. Actually no fracture of the rims occurred but particles of the cement filling were thrown out, their travel being restricted by the shot mats. A heavy wire stop was fixed between the front legs to assist in the flotation of the rear leg in the event of damage. Buoys and log lines were fixed to the head of the sheers and the lower ends of the front legs to assist in recovery operations should the sheers sink in the basin before being towed into dock. In addition, a hauling wire was secured to the head of the sheers and led across the basin to a capstan at the dock entrance for towing the sheers after demolition. The whole of the foregoing work was completed on the eve of the demolition day.

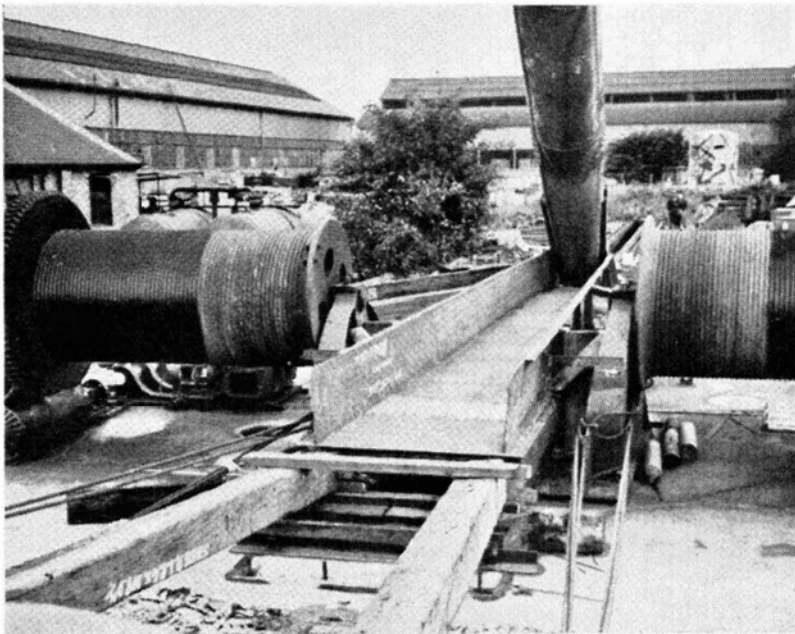


FIG. 2.—SLIDE FOR REAR LEG

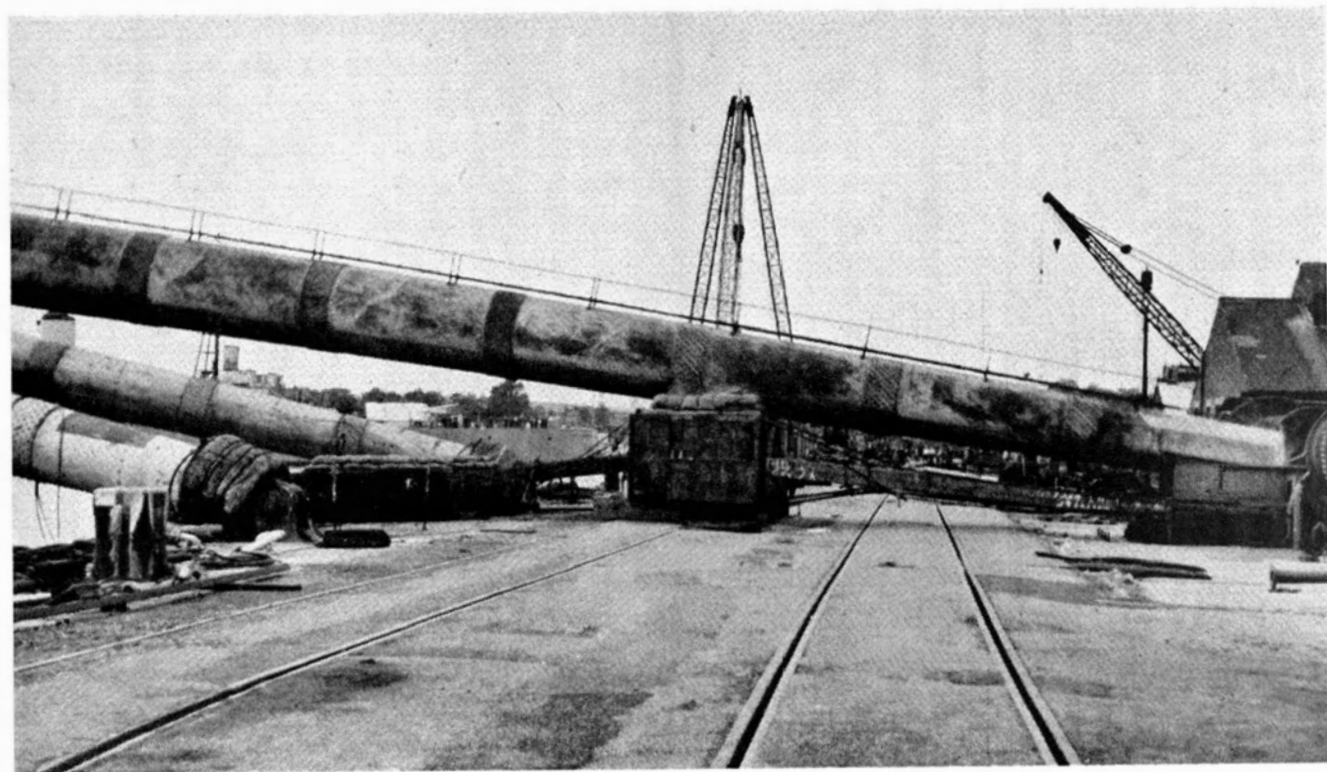


FIG. 3.—IMPACT OF REAR LEGS ON RAMP

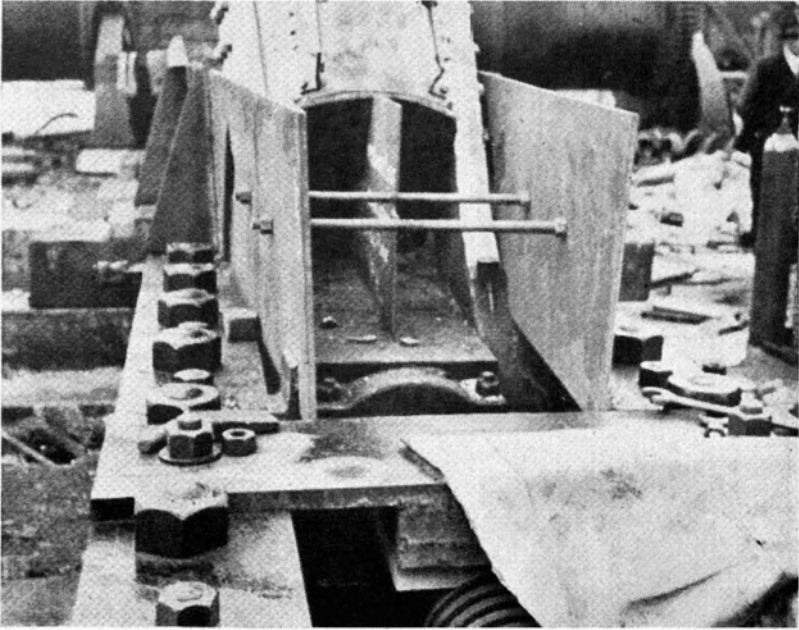


FIG. 4.—SIDE AND FLAME BAFFLE PLATES

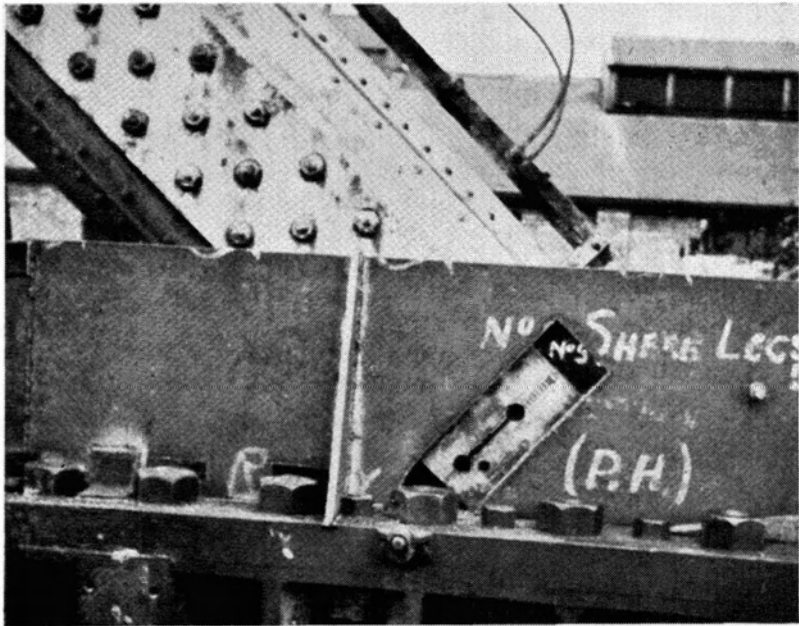


FIG. 5.—CUT BETWEEN HOLES DRILLED IN ANCHORAGE PLATE

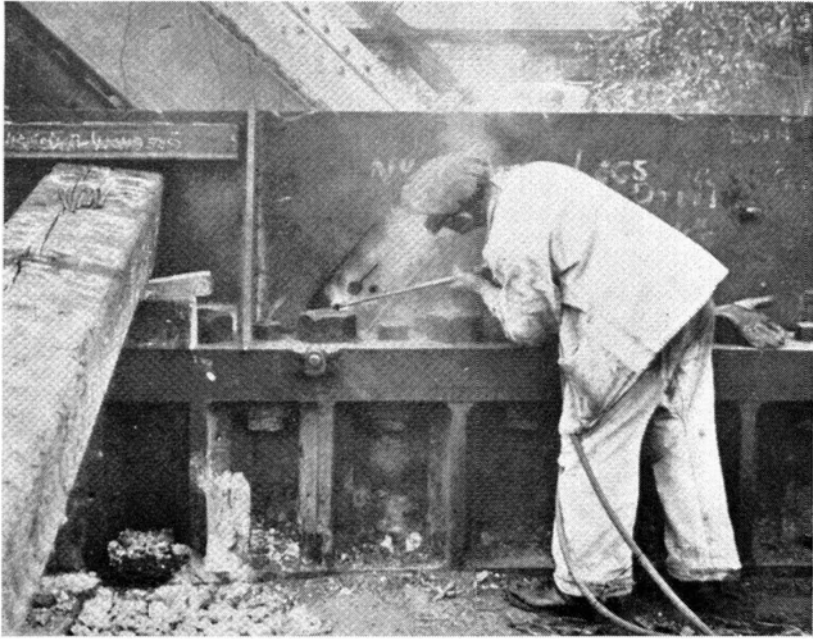


FIG. 6.—CUTTING AWAY THE UNDERSIDE MATERIAL.

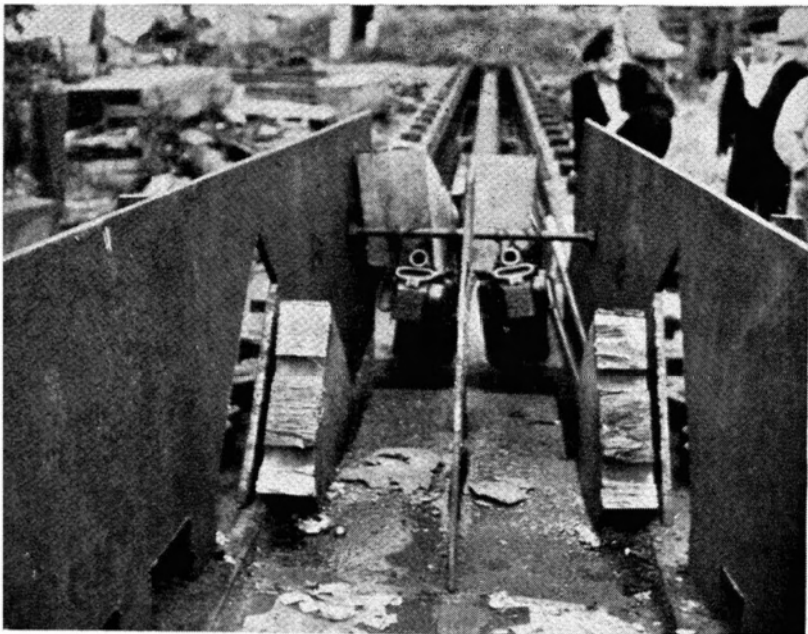


FIG. 7.—THE ANCHORAGE PLATES AFTER CUTTING

In order to sever the rear leg anchorage plates which were 4 in. thick, two 2 in. holes were drilled in each plate in such a position as to leave 3 in. of material on the underside and 6 in. on the top side. The remaining topside material was marked off in $\frac{1}{2}$ in. spaces. The side wall plates previously mentioned had been extended beyond the rear leg anchorage plates and openings were cut for the burner to operate with safety. In addition, a flame baffle plate was secured at the base between the two side walls (see Fig. 4). The first operation was to marry the two 2-in. holes previously drilled in each anchorage plate (Fig. 5). This was accomplished in 4 mins. The metal was then severed simultaneously at each side between the lower side of the plates and the lower holes (Fig. 6), the time taken being 1 minute. The final cuts were then made by cutting upwards from the edge of top holes, 1 in. at a time simultaneously, 3 minutes being sufficient for this operation.

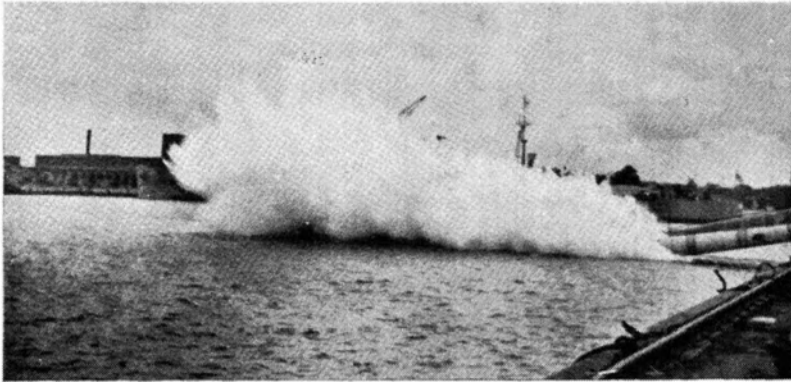


FIG. 8.—IMPACT OF SHEERS ON THE WATER

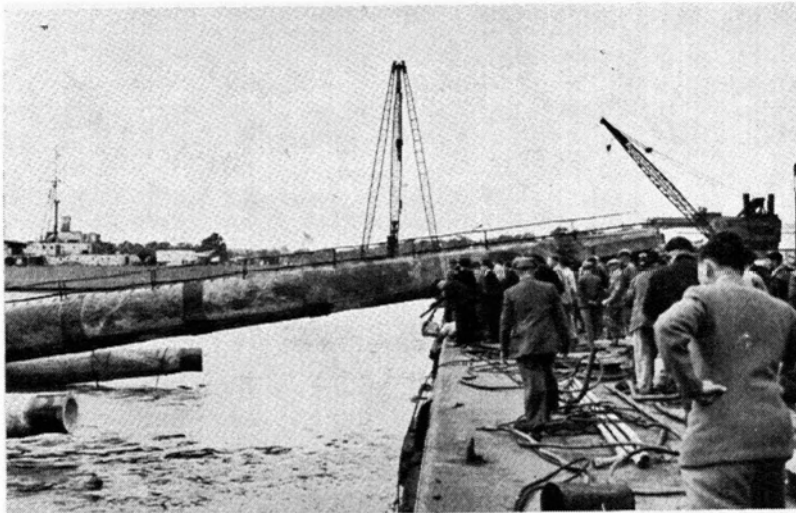


FIG. 9.—FINAL POSITION OF SHEERS ON THE RAMP

With approximately $\frac{1}{2}$ in. of material left (see Fig. 7), the rear leg moved and parted from the housing. The initial movement was slow but momentum was rapidly gained and the path of the leg deviated less than 6 inches from the centre of the slide. The rear leg, on contact with the first ramp (Fig. 3) was thrown upwards and at about this stage the front legs parted from the front sockets (Fig. 8).

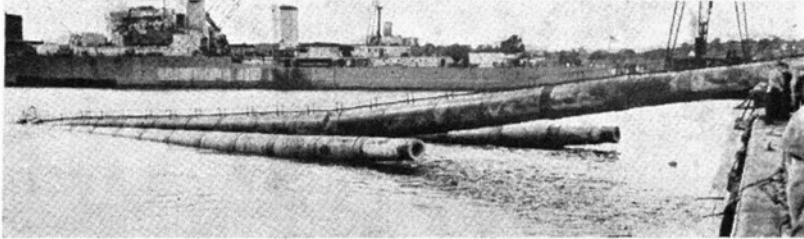


FIG. 10.—POSITION OF SHEERS AFTER DEMOLITION

The front legs then settled on top of the water and the rear leg finally rested with about four feet on the high ramp (see Figs. 9 and 10). The head wire slack was taken up by the capstan and the rear leg was dragged off into the water and the legs towed to the dock entrance (see Fig. 11). Docking down operations for cutting up of the legs completed the programme.

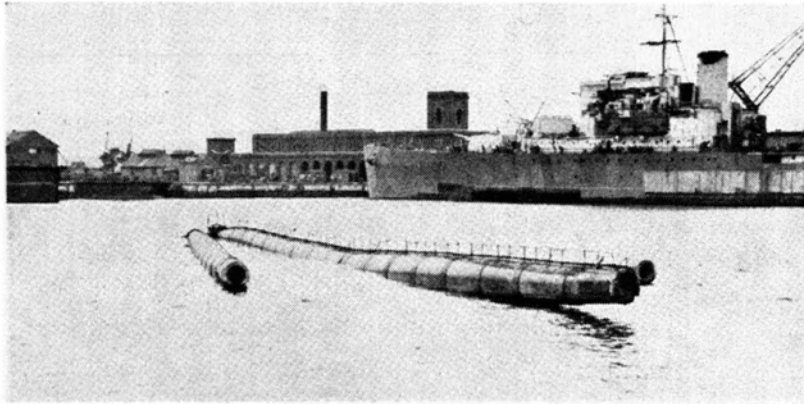


FIG. 10.—SHEERS BEING TOWED TO DOCK ENTRANCE

