REBUILDING AN OIL FUEL INSTALLATION.

The work of the base engineer officer of a captured port is often rendered more difficult by the lack of suitable material. In the following article, details of the methods employed to build up an effective oil fuelling system for ships at Tripoli, using only local resources, is described.

Tripoli had been used by the Italians as a fuelling station for torpedo boats, the plant consisting of 12-in. pipe-lines along the Karamanli Mole, ready-use tanks and pumps at the head of the mole and large 10,000-ton storage tanks with a main pumping station about half a mile inland. The greater part of the installation had been destroyed before Allied occupation. The only part left undamaged was the ready-use storage tanks with a capacity of 1,200 tons and the underground main pumping station. The large storage tanks inland consisted of metal containers sunk into the ground with concrete retaining walls, the metal of the tanks had, however, been completely shattered.

On investigation it was found that there were several redeeming features. There was enough 12-in. piping, for instance, to complete one supply line along the mole and to both the ready-use tanks and the main pumping station. It was also possible to produce from pieces of the original Tosi diesel engines and pumps at the main station, enough to make one complete unit having an output of about 300 tons of oil an hour.

The next problem was the putting into service of a main storage tank. One of the tanks whose concrete walls were in better condition than the others was selected and the vast quantity of scrap metal at the bottom removed, mainly by Italian prisoners. The walls were then covered with a thin layer of reinforced concrete using a fine mesh wire and given a smooth inside finish. This took nearly two months to complete. A swing arm was led from the suction connection at the bottom of the tank and arranged so that oil was always taken from just below the surface. As a roof was needed to cover the tank from the effects of sun and rain this problem was solved by taking the roof off the local railway station, reconstructing it in sections at the side of the tank and sliding it across on runners, span by span.

Meanwhile, a small standby pump unit of about 100 tons capacity was installed in the main pump house, while two 6-in. Caterpillar-Gould diesel

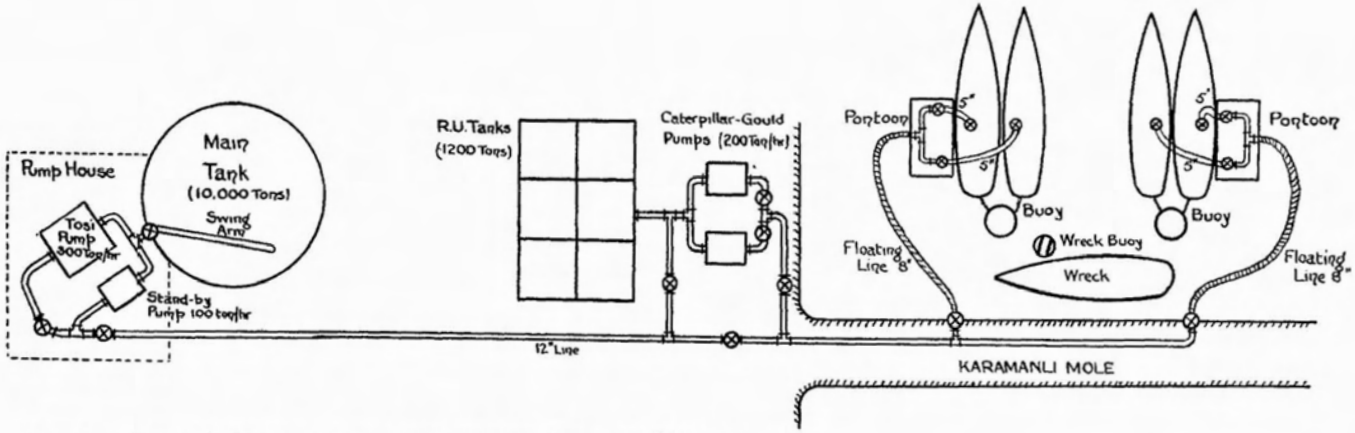

FIG. 1.—(ABOVE) ARRANGEMENT FOR OILING SHIPS AT TRIPOLI USING FLOATING PIPE LINES

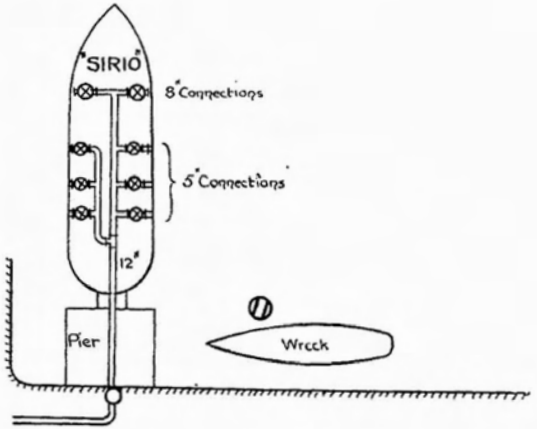

FIG. 2.—(RIGHT) OILING JETTY BUILT ON DECK OF THE SUNKEN "SIRIO"

pump units, each of 200 tons per hour capacity, were installed in a specially constructed pump house near the ready-use tanks. These were intended either to boost the oil from the tankers up to the main tank, or as the normal supply from the ready-use tanks to ships, the tanks being kept filled from the main supply tank.

At the same time consideration was given to the actual fuelling of the ships. This was rendered difficult by two small torpedo boats which had been sunk alongside the mole so that destroyers could not back right in as was the practice under Italian control. It was initially decided to use floating lines so two 8-in. fuelling connections were made on the 12-in. line. These 8-in. lines, consisting of steel piping joined by rubber connections and buoyed with small round metal floats were then taken out to a pontoon which could be dragged alongside the ships. It was arranged for these to be moored stern to shore to two large mooring buoys about 100 ft. from the mole. Each pontoon had two 5-in. oiling connections on the 8-in. line controlled by valves and sufficient metallic flexible hose to fuel two ships alongside each other. Adaptors and tools were also provided on the pontoons.

The scheme was now ready for trial and the main tank was filled with oil direct from a tanker. This took place about the first week in June, work on the scheme having started early in March. The first ships requiring oil, several *Hunt* class destroyers were successfully fuelled shortly afterwards, a total fuelling rate of about 400 tons an hour being maintained. The layout of the plant is shown in Fig. 1.

Oiling jetty.

The operation of the floating pipe-lines was found cumbersome and it was decided to try to arrange an oiling jetty. A small pier about 25 ft. long was built out from the shore to a point where there was about 28 ft. of water; incidentally, the bottom of the harbour had been dredged comparatively level by the Italians. A vessel which could fairly easily be refloated was selected from the many wrecked Italian ships in the harbour. This was the *Sirio* of about 5,000 tons with engines right aft. Various holes in the hull were patched or plugged and she was refloated by the aid of compressed air. The vessel was towed across the harbour and sunk stern first at right-angles to the mole and as close to the pier as possible; she eventually settled down about 10 ft. from the pier and dead upright. This whole operation was carried out by the Port Salvage Party and took less than three weeks.

The 12-in. pipe-line was then led right up on to the ship and along the deck. Eight fuelling connections were arranged, four each side, two 8-in., for taking oil tankers and six 5-in., for fuelling ships. A sloping ramp bridge about 5 ft. wide was built on to the deck for ease in getting aboard and a large amount of the superstructure was cleared away. The arrangement is shown in Fig. 2. This system worked very well indeed and four ships were almost continuously being fuelled alongside during the Sicilian operations.

A 4-in. water main was also taken to the wreck with four 2-in. supply connections. This proved a great boon and was much appreciated, especially by the old hands in the Eastern Mediterranean who had so often complained of the absence of the water boat when coming in for a rapid refuelling operation.

It was also found possible later to stow about 400 tons of diesel oil in the ready-use tanks, fit up a small pump and take a 6-in. supply line up on to the wreck. This was very useful for fuelling craft requiring more than the normal few tons.

The work of construction of the fuelling installation on shore was carried out by the Royal Engineers, the designs being the joint effort of the Chief Engineer and the Base Engineer Officer.