

MANUAL FOR SUBMARINE MINING

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Manual for Submarine Mining by R. W. Pinger

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R. W. PINGER.

2nd Lieut. Coast Artillery Corps.

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This Manual for Submarine Mining, revised to 1912, is approved and published for the confidential information and guidance of the Army of the United States. Under no circumstances shall its contents be divulged to persons not in the military or naval service of the United States.

By order of the Secretary of War:

WM. H. CARTER,
Major General, Acting Chief of Staff.

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CHAPTER I.

DEFINITIONS AND GENERAL PRINCIPLES.

A submarine mine consists of an explosive charge inclosed in a water-tight case, and a firing device, the whole intended to be submerged in a waterway which it is desired to close against the passage of an enemy's vessels.

With respect to the position of the case containing the explosive, submarine mines are of two classes, buoyant and ground.

In the buoyant mine, the case contains the explosive and the firing device, and has such excess of buoyancy that it would float were it not held below the surface by a mooring rope and an anchor. The submergence is such that, while the mine would be struck by the hull of a passing vessel, it is not so near the surface as to be seen.

Buoyant mines may be planted and operated successfully in water 150 feet deep. They should not, in general, be used where the depth of water is less than 20 feet.

In the ground mine, the case contains the explosive and the firing device, and is heavier than the displaced water; it therefore rests upon the bottom and requires no anchor. Ground mines are not used where the depth of water exceeds 35 feet.

With respect to the means used to fire them, mines may be classed as mechanical and electrical.

Electrical mines are, in turn, of two general classes, controllable—in which the firing device is under control after the mine has been fixed in position; and noncontrollable—in which no such control is had.

Mechanical and noncontrollable electrical mines are intended to be fired only by the blow of a passing vessel. When once in position they are dangerous alike to friend

and foe, while controllable mines may instantly be made safe for friendly vessels or as quickly made dangerous to vessels of the enemy.

Controllable electrical mines are arranged so as to give a signal to the operator when they are struck. They may be set to fire automatically when struck or tampered with, or may be fired at the will of the operator. In the latter case the firing may be delayed, in which case the operator fires the mine some short interval after the signal indicates that it has been struck; or by observation, in which case he fires it after the position-finding system shows that the vessel has come within the mine's destructive radius.

LOCATION OF MINES.

The considerations involved in the location of mines are of two general classes, tactical and local.

Tactical considerations deal with the position of mines with reference to the other defenses. Local considerations deal with the width and depth of the channel, the swiftness of the current, the variation of the tide, and the relative importance of the harbor.

Where ordinary ship channels are unobstructed it is possible for modern battleships, with their high speed and heavy armor, to run by shore batteries, at least in the night or during a fog; hence the defense of such channels should not be left to guns alone.

On the other hand, where mines are unprotected by the fire of shore batteries it is possible for an enemy to remove or disable them.

Therefore guns and mines, the two elements of the fixed defenses of a harbor, are mutually dependent, and when the location of one has been decided upon that of the other must conform thereto.

Within the zone between 4,000 and 8,000 yards of the main defense the fire of heavy guns is destructive for warships, yet the latter are at such a distance that their rapid-fire guns will be of little effect against the batteries.

Moreover, at 4,000 yards vessels are just beyond the inner limit of mortar fire.

If possible, therefore, hostile vessels should be held in this zone by some obstacle. Such obstacle is afforded by a mine field.

On the other hand, attacks upon a mine field are most liable to be made by small boats at night. If the mine field be at too great a distance from the defenses, these boats will not be revealed by the mine searchlights. Furthermore, for protection against such attacks, the defense relies upon rapid-fire guns of relatively limited range.

Due to the above considerations the outermost mines are usually placed between 3,000 and 4,500 yards from the main defense.

In general, there should be in each main channel at least three lines of mines.

ELEMENTS OF A MINE SYSTEM.

The elements of a mine system are:

1. **The mining casemate**, consisting typically of four rooms: (1) The operating room, containing the power panel and the operating boards; (2) the engine room, containing the engine and the generator; (3) the battery room, containing the storage battery; and (4) the sleeping room for the personnel.

2. **The multiple cables**, 7 and 19 conductor, leading from the casemate out to the distribution boxes, one of which is in the center and rear of each group of mines.

3. **The single-conductor cables**, radiating to the front from the distribution boxes, one leading to each mine.

4. **The mines**, in groups of 19 or less, extending across the waterway to be defended, planted approximately 100 feet apart and anchored so as to have a submergence of about 10 feet at low water. The groups are numbered 1, 2, 3, etc., from left to right of the observer stationed in rear of the line, and the mines in each group are numbered similarly, No. 1 being on the left, No. 10 in the center, and No. 19 on the right.