ANNUAL REPORT

OF THE

CHIEF OF THE REVENUE MARINE BUREAU

FOR

THE FISCAL YEAR ENDING JUNE 30, 1873,

SHOWING

THE OPERATIONS OF THE REVENUE MARINE AND THE LIFE-SAVING SERVICE.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1873.

APPENDIX.

REPORT OF EXPERIMENTS WITH LIFE-BOAT AND ROCKET APPARATUS.

OFFICE OF INSPECTOR OF LIFE-SAVING STATIONS,
No. 16 *Broadway, New York, September* 1, 1873.

SIR: I have the honor to submit the following report of experiments made at Station No. 1, 2d District, Narragansett Pier, between the 25th and 30th ultimo.

Under the letter of authority dated August 16, I had conveyed to the station by the revenue steamer Grant, the life-boat and rocket apparatus recently received from England. I also proceeded in the Grant, which anchored off the station on the morning of the 25th. A detachment of nine men was landed by Captain Slicer, and placed at my disposal, there being no regular crew of surfmen attached to the station. After getting the rocket apparatus into order, and assigning the men to their proper stations, I proceeded to instruct them in a drill which I had modified from the English method.

The English rocket apparatus used consists of the following articles:

Boxer rockets.

Rocket frames to hold rocket for firing.

Rocket signal, red and white.

Rocket sticks to attach to rockets.

Rocket pins, of iron, to secure sticks to rockets.

Washers, of India rubber and metal, to attach line at head of rocket for taking up jerk when fired.

Detonating tubes for igniting rockets.

Fuzes for igniting rockets, if detonating tubes fail.

Signal lights.

Three rocket lines, each 530 yards in length, made of Italian hemp laid up loosely.

Three boxes fitted with faking pins, in which to store rocket lines.

A hawser of 3-inch manila, right-handed rope, 120 fathoms long.

A whip of 1½-inch manila line laid up loose, left-handed, 280 fathoms, rove through a single-tailed block, sheave brass-bushed, the tail 2 fathoms long, ends of the whip spliced together, connecting it in an endless rope.

A sling life-buoy, with petticoat breeches, in which to place the person to be rescued and haul him ashore.

A traveller, or inverted block with a brass sheave, to be attached to the sling and carry it along the hawser.

A double-block tackle-purchase, for setting taut the hawser, one of the blocks being fitted with two tails to bend on the hawser.

A tripod of iron, fitted with a swivel snatch-block, through which the hawser can be passed to raise it above the water.

An anchor with one fluke, to be buried in the earth, sand, or shingle, to which to set up the hawser by means of the tackle-purchase.

A red flag, attached to a staff, to be used in making signals by day.

A red lantern, for the same purpose at night.

A spade and pickaxe, to be used as occasion may require.

Three sets of tally-boards; each set consisting of two boards of hard wood, about nine inches long by five inches wide and three-quarters inch thick. These boards have the words quoted below painted on them in white letters on a black ground, English on one side and French on the other, viz:

No. 1. Tally-board to be attached to the whip: "Make the tail of the block fast to the aft mast, well up; if masts are gone, then to the best place you can find; cast off rocket-line, see that the rope in the block runs free, and show signal to the shore."

No. 2. Tally-board to be attached to the hawser: "Make this hawser fast, about two feet above the tail block; see all clear and that the rope in the block runs free, and show signal to the shore."

Long lights—one box of Colonel Boxer's, to be used as occasion may require.

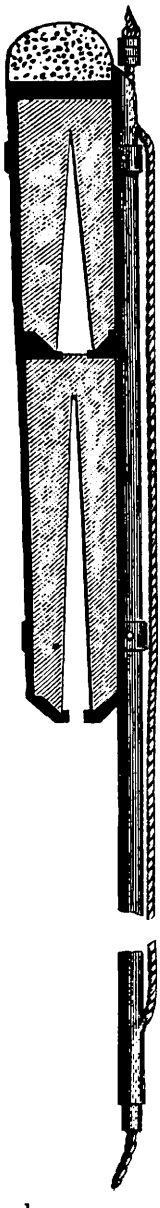
Signal rockets—eighteen, throwing white and red stars.

Two heaving sticks and lines, to be used as occasion may require.

A tarpaulin, to cover over the apparatus and stores in the cart when the apparatus is not in use, and fitted with beckets and tent pegs to secure it on the beach or shore for coiling the whip on when the apparatus is in use.

The rocket for carrying the line is that in general use on the coasts of Great Britain for life-saving purposes, by the Royal National Life-boat Institution, and was invented by Colonel Boxer of the Royal Army. It is a double rocket, with two charges of composition in the same plane, contained in an iron case of $\frac{3}{16}$ inch. Its length is two feet; diameter, $2\frac{5}{8}$ inches; weight, 14 pounds. A stick, 10 feet long, is

attached to the case, and secured by an iron pin when the rocket is to be used. The form of the rocket will best be understood by referring to the accompanying sectional sketch.



After the first charge has expended its force, the second charge at the head of the rocket is immediately ignited and the rocket is driven with accelerated force on its errand. The whole apparatus was easily stowed in a hand-cart belonging to the station, and was readily hauled up and down the beach by the rocket party from the Grant. The drill was quickly understood by the men, and in a short time they were able to unload the cart and set up the apparatus ready for firing in five minutes after the command "Action" was given. After familiarizing the party in the use of the apparatus without firing, experiments were begun to determine the range of the rockets by firing along the line of the beach. The following results were obtained:

The first rocket, fired at an elevation of 37 degrees, carried the line 349 yards along the beach, but in running off the faking pins in the box the line fouled in three places. The rocket went wide of its aim and dropped just in the edge of the surf, wetting about 100 yards of the line.

The same line, wet and clogged with sand, was "French faked" on the sand, and the second rocket fired at an elevation of 35 degrees, carrying the line 275 yards. A dry line was then attached to the third rocket and was carried, by an elevation of 30 degrees, 350 yards; while the fourth rocket, at same elevation, carried the same line 410 yards. The fifth, sixth, and seventh rockets, at same elevation, carried the line, respectively, 300, 385, and 375 yards. After firing the first rocket, the range was got under better control, and each succeeding one was sent more accurately in the direction desired. The apparatus was then tried in actual practice by throwing a line over the Grant, lying 350 yards from the rocks, and a seaman belonging to the vessel was landed safely on shore in forty-seven minutes from the time the rocket was fired. The breeches buoy was used on this occasion, but it was impossible to haul the hawser taut enough, with the vessel swinging to her anchors and rolling in the swell of the sea, to keep the buoy, with the man in it,

wholly out of the water. After landing the man, one person could have been hauled ashore every eight minutes. The rocket apparatus was next tried, with the Grant 350 yards from the beach in front of the station, using the American life-car instead of the English breeches buoy, and one of the crew of the Grant was hauled on shore and landed "dry-footed" in thirty-one minutes from the firing of the rocket. As the car is capable of carrying four persons, and could be hauled back and forth in six minutes, it will be seen that many more persons could be landed from a wreck within a given time by this means than by the English plan.

Incidental to the experiments with the English rockets, the Lilliendahl rocket, with which Station No. 1 is supplied, was also tried, but with not very satisfactory results. Its flight is too rapid, starting from its frame with such velocity as to endanger the line. It lacks the accelerating qualities of the Boxer rocket, and consequently is much inferior to the latter.

The experiments with the English rocket apparatus at Narragansett developed its value as a means of establishing communication with wrecked vessels far beyond any line rocket ever before used in this country; but no greater range was obtained than has also been effected by the 5-inch mortar in use on our coasts, which is not only much more simple in its parts, and consequently more easily handled, but also a cheaper method—the Boxer rocket apparatus costing $635, while the cost of the mortar, with the necessary balls, ammunition, lines, &c., will hardly exceed $550. The mortar is always ready for use, and in practising the crews the balls can be recovered, while the rocket is expended altogether, in actual service or in drill. As the Boxer rockets cannot be manufactured in this country, and their merits do not exceed the mortar apparatus sufficiently to justify their importation, they are not recommended for use on our coasts. In my opinion, the mortar and balls now in use will meet the wants of the service until some better device is obtained. I propose, however, as an addition to the mortar apparatus, a light hand-cart, for transporting the mortar, balls, lines, &c., along the beaches.

I had conveyed to Narragansett, also by the Grant, the life-boat lately received from the Royal National Life-boat Institution of Great Britain. At no time during my stay at the station was an opportunity presented to test the boat in a heavy sea, but several trials were made with her in smooth water. She was found to pull easily under eight oars, double-banked, answered her helm readily and displayed most excellent qualities for a surf-boat. She was capsized after considerable effort on the part of ten men aided by tackles, but righted instantly,

full of water, freeing herself entirely within twenty-five seconds. The boat is built of two courses of mahogany boards one inch thick, fastened together diagonally. Her length is 30 feet, with extreme beam of 7 feet 1 inch, and a depth of 3 feet 6 inches. There are four thwarts for eight rowers, double-banked, and the deck upon which their feet rest is 3¾ inches above the water-line, with a full crew and all the gear on board. The deck is perforated by four discharge pipes 3½ inches in diameter, moving down to the keel, and each provided with a valve of peculiar pattern which opens to a downward pressure of water running from the deck, but closes against an upward pressure and prevents the water from surging up through the pipes. The bow and stern are provided with capacious air-chambers raised above the sheer of the gunwales, and are for the purpose of tripping her when capsized and causing her to right at once. To add to her buoyancy, when filled for the moment with water, under the thwarts along the sides, there are shifting air-tanks of wood, covered with light canvas and marine glue. Although the model of this boat seemed almost perfect for the purpose intended, she was found to be too heavy (weighing nearly 4,000 pounds) for use on our flat beaches by the light crews at present attached to the stations. It is thought, however, that boats of smaller dimensions, say 26 feet long, and properly proportioned, similar in design to the Royal National Life-boats, would be found very useful at points on our coasts, including the great lakes, where they could be launched at once into deep water, and pulled out of harbors or from behind piers. A transportation carriage was sent with the life-boat from England. It is altogether too heavy for use in this country, but is admirably contrived for launching purposes.

There seems to be no doubt that the life-saving institutions of Europe, particularly those of England, France, and Germany, have perfected boats and many other appliances for rescuing shipwrecked persons, far superior to our own; and it is respectfully submitted for the consideration of the Department, whether the interests of the Life-Saving Service may not be advanced by an examination of all the foreign systems, either by the personal inspection of a commission sent for the purpose, or through the agents of the United States abroad.

Very respectfully, your obedient servant,

J. H. MERRYMAN,
Captain R. M. S., and Inspector.

S. I. KIMBALL, Esq.,
Chief of the Revenue Marine Bureau,
Treasury Department, Washington, D. C.