

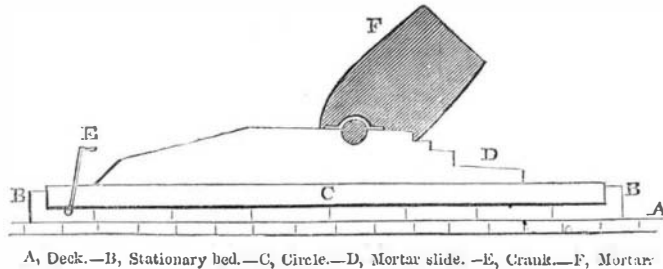
**THE MORTAR FLEET AND MORTARS.**

On page 18 (present Vol.) SCIENTIFIC AMERICAN, we first published a brief account of the flotilla of mortar vessels which is being fitted out at this port under Commodore Porter, for operations against some of the fortified places on the Southern coast. The fleet is now in a forward state of preparations, and it is stated, will soon be ready to sail. It is composed of one steamer—the flag ship—and twenty schooners of light draft. These are what may be called bomb-

called *carcasses*. These are designed for setting fire to besieged places. The range of mortars is obtained by observation and calculation. This requires science and practical skill. For a thirteen-inch mortar one gunner and four cannoners are necessary. The firing is slow—about ten rounds per hour. About 8,000 rounds have been furnished for the fleet.

It is understood that a code of signals has been adopted, and the method of placing and anchoring the vessels for attack determined upon. The mortars cannot safely be fired directly over the sides of the

Mortars are among the oldest species of artillery. They were used to throw balls, red-hot shot and stones long before shells were known. Bomb shells are said to have been invented by the English and were first used in 1588. Ten inch mortars are the most common size. Hand mortars were formerly carried upon poles and fired by a special corps called bombardiers. The largest mortar ever used was one of 24 inches in diameter which was effectively employed by the French army in 1832 at the siege of Antwerp. It discharged shells each weighing 1,015 lbs.



A, Deck.—B, Stationary bed.—C, Circle.—D, Mortar slide.—E, Crank.—F, Mortar.

**SECTION OF MORTARS.**

ketches of from two to three hundred tons burthen. Each schooner is armed with a 13-inch mortar having a bore of 35 inches in depth, and weighing 17,000 lbs. They were all cast at Pittsburgh and have been submitted to very severe tests. Being very heavy, and their recoil being so great, the mortar frame is braced with extraordinary care as represented by the section of the schooner in the figure. The timbers are over a foot square in thickness and 12 feet in length. The whole interior framing of each schooner is very strong. A mortar is a short wide gun for firing bomb shells. It is usually set at an angle of 45° and throws its missile into the air, and when it reaches the proper distance and elevation, it falls down upon the enemy and explodes. The range is

vessel, and therefore the fleet must be partially headed towards the point of attack. The officers are ordered to anchor in the proper position, and to remove a part of the rigging of the vessels, and trust to their best judgment in firing.

The extraordinary weight and strength of the mortars; the long range and high velocity of the projectiles, and their terribly destructive character, combine to render the expedition one of the most important that has been undertaken during the war.

The fleet will be arranged in three divisions, as follows:—

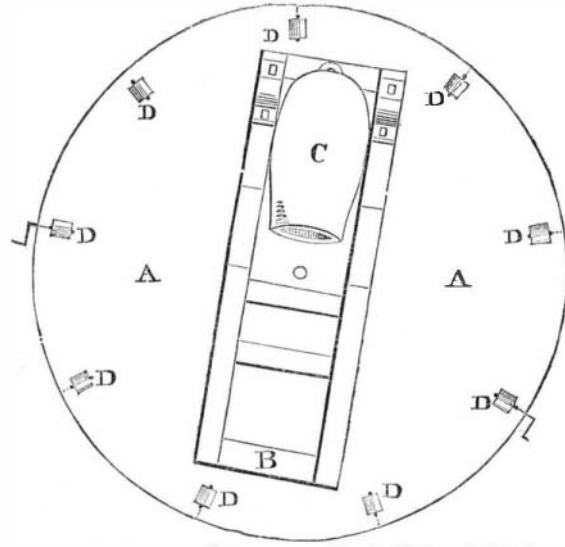
FLAG SHIP—Side wheel gunboat *Octorara*, Commander D. D. Porter, commanding.

FIRST DIVISION (Lieutenant Watson Smith commanding)

which were very destructive and soon brought the city to conditions of surrender. Great expectations have been formed of our mortar flotilla.

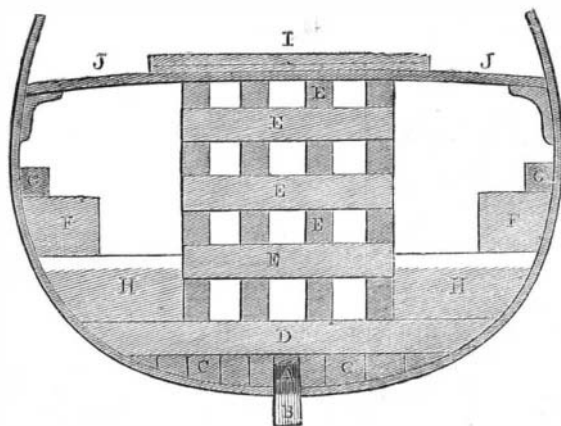
**High Pressure Steam in England.**

We find the following in an editorial in the *London Engineer*:—With respect to heat, steam and the steam engine we cannot doubt that practical opinion is more advanced now than it was even a year ago. If no absolutely new facts have been discovered, others have become more widely and usefully known. The belief in the advantage of high-pressure steam has been constantly increasing, and we have lately had Mr. Fairbairn's declaration of his confidence in the ultimate adoption of a pressure as great as 500 lbs. to the



A A, Mortar bed.—B, Slide.—C, Mortar.—D, Rollers.

**PLAN OF REVOLVING PLATFORM.**



A, Keelson.—B, Keel.—C, Oak filling.—D, Oak floor timbers.—E, Pine cross-timbers.—F, Lockers.—G, Hummock lockers.—H, Water tanks.—I, Mortar bed.—J, Main deck.

**SECTION OF SCHOONERS.**

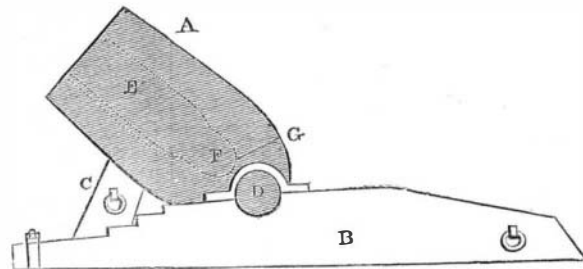
always reached by the quantity of powder put into the charge. For different distances different quantities are used, hence a powder chamber as shown in one of the figures, is cast in each. Each mortar is set upon a revolving platform which can be turned in any direction. The figure showing the plan of the platform and mortar represents their parts and crank handles for revolving the frame. Each large mortar is capable of throwing a shell weighing 197 pounds to a distance of 2½ miles. About 20 pounds of powder is used for such a range. Time fuses are generally employed for bomb-shells. Sometimes shells are filled with an inflammable rocket composition and are

(ding)—Schooners *Norfolk Packet* (flag vessel), *Oliver Lee*, *Wm. Bacon*, *Arietta*, *C. P. Williams*, *Para*.

SECOND DIVISION (Lieutenant W. W. Queen commanding)—Schooners *T. A. Ward*, (flag vessel), *George Mangun*, *Adolphus Hugel*, *Matthew Vassar, Jr.*, *Sidney C. Jones*, *Maria J. Carlton*, *Orvetta*.

THIRD DIVISION (Lieutenant R. Randolph Breese commanding)—Schooners *J. Griffith* (flag vessel), *Racer*, *Sarah Bruen*, *Sea Foam* (brig rigged) *Henry Jones*, *Dan Smith*.

The *Horace Beale* and *A. Houghton* are also of the flotilla. It is understood they will carry only ordnance and ordnance stores and substance.



A, 13-inch Mortar.—B, Slide.—C, Quoin.—D, Trunnion.—E, Bore.—F, Chamber.—G, Vent.

**SECTION OF MORTARS.**

square inch. We may not yet be prepared to work advantageously pressures greater than 100 lbs., or even 50 lbs. at sea, but some of our engineers are already working from 200 lbs. to 150 lbs. in ordinary land boilers, and the Messrs. Perkins were last year working an engine at pressures varying 350 lbs. to 600 lbs. per square inch.

ONE of the best preventives of the ravages of wheat-destroying insects is early sowing.

THE municipal taxes of the city of Philadelphia, in 1861, amounted to \$3,080,782.