

stem to stern; it is strongly arched in the athwartship direction, having a curve of about 4 feet.

Minute water tight subdivision of the hold space below the protective deck, and of the space between it and the main deck, is effected by means of transverse and longitudinal bulkheads and of horizontal flats or platforms.

She has twin screw propellers driven by two independent sets of machinery. The engines are horizontal, and on the two-cylinder compound principle.

The armament is exceptionally heavy and powerful for a ship of such moderate size; and the mountings are of a very novel character, representing some of the latest products of the famous Elswick factory.

One important feature in the arrangement is the strong steel loading station built in the rear of each gun. This is really a large steel house, within which are the upper ends of steel tubes, extending down to the magazines and shell rooms.

Having reached the loading station, the gun is laid fore and aft, and run in on the slide, being elevated for the purpose of loading. After the breech piece has been withdrawn, the projectile and powder charge are rammed home; and throughout the operations the powder is protected from rifles and machine guns.

On each broadside there are also three 6 inch 80 pounders, carried on central pivot automatic carriages, and having a horizontal range of training of about 180 degrees.

The Esmeralda has also a very good auxiliary armament with which to deal blows upon an enemy similar to those against which her men are exceptionally well protected.

We are indebted to the Engineer and the Graphic for these particulars and for our illustrations.

White Bricks.

M. Hignette, in the Bulletin technologique des Ecoles nationales d'Arts et Metiers, describes a new ceramic product from the waste sands of glass factories, which often accumulate in immense quantities so as to occasion great embarrassment.

WORKERS in bleacheries where chlorine is largely used are singularly exempt from all germ diseases, but suffer from special ailments induced by inhaling that gas.

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NEW YORK, SATURDAY, NOVEMBER 22, 1884.

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GRINDING REAMERS.

Every machinist knows the tendency of reamers to chatter and leave flutings. The most careful handling could not always prevent it. For a remedy the scores or flutings of the reamers have been made of uneven numbers, so that a space should oppose a tooth; and sometimes a "slashed" or spiral tooth has been cut instead of a straight one.

In a large establishment for the manufacture of hand and machine tools, some experiments have been made with reamers with a result of nearly, if not entirely, removing this tendency to chatter. The remedy is in grinding the flutes or teeth on their face or cutting side, so that they present a sharper angle to the work, and cut rather than scrape.

After the reamer has been fluted in the milling machine or the crank planer, and hardened and tempered, it is submitted to the action of a narrow, round-faced emery or corundum wheel, that cuts under the straight face of the flute and projects its head forward, making a more cutting angle. Trials on very hard charcoal iron castings seem to prove the advantage of this after-grinding. This test was proved on a hole for a taper fit. The finished steel pin was placed in the reamed hole, and driven to seat by a Babbitt metal hammer.

WHAT THE DOCTORS SAY ABOUT BICYCLE RIDING.

Those who work the pedals of the graceful bicycle will, unhappily, find little to commend their favorite exercise in the columns of the medical journals. From time to time there have appeared the results of inquiries of the medical faculty into the effect produced upon the body by continued bicycling; and though a verdict may scarcely be said to have been rendered, the evidence presented proved, in some cases, sufficiently convincing to condemn the practice.

This results, he says, in irritation and congestion of the prostate and surrounding parts, tends to exhaust and atrophy the delicate muscles of the perineum, and leads to early impotence. Many cases could be cited where races have become almost totally impotent from immoderate equitation, as the Tartars, and partially so from the same cause, as the Indians. Like others who have written on the subject, Dr. Strahan speaks of the "disease of the Scythians," but doesn't tell us just what it was.

THE EADS SHIP RAILWAY.

The working model of Captain James B. Eads' plan for the Atlantic and Pacific ship railway, now in process of construction across the Isthmus of Tehuantepec, has been brought from London, and is now on exhibition in this city, in the basement of the Mutual Life Insurance building, Nassau and Liberty Streets.

It represents the hydraulic lifting dock, by which the largest ships are quickly lifted out of water; the railway cradle and truck, by which the great vessels are transported across the country; and the hydraulic turn table, by which truck and ship are rapidly revolved to meet any required changes of direction in the line of travel of the railway.

The gigantic size of the cradle truck that bears the ship overland forbids the employment of curves of a less radius than twenty miles; but by means of the hydraulic turn table, which is simply a great float, the largest vessel may be turned, switched off to pass other vessels, and run upon any desired diverging track, thus obviating the necessity of curves in the railway track itself.

The Tehuantepec Ship Railway will be 134 miles in length. It commences on the Atlantic side at Minatitlan, and will terminate on the Pacific side probably at Salina Cruz.

The working model now shown is made to a scale of three-quarters of an inch to a foot, and occupies a length of