

THE NEW REVENUE CUTTERS.

The new steam vessels about to be added to the revenue service of the country will certainly be the finest ships of their class the nation has ever possessed, if they are completed according to the designs of their builders. The officials charged with their construction have taken the right course to obtain the best models for the purpose. We are informed that the Revenue Department made known their wishes to prominent ship-builders of the country, stipulating only that the load carried and draft of water of the several vessels, six in all, should be the same. In all other respects the builders were left to carry out their own ideas in respect to model, &c., untrammelled; the result is a collection of beautiful ships. A marked difference is observable by the mechanical eye in the proportions of the several hulls, and it is confidently believed that each and all of the cutters will not only prove themselves worthy of the expectations they have excited, but they will inaugurate a new era in this class of our national steam marine. Most of the vessels heretofore commissioned for this duty were exceedingly unfit for it, the *Harriet Lane* (now in the hands of the rebels) alone excepted. They are nearly all old-fashioned models, and wallow about in the most approved style in a heavy sea. The new ships will be both fast and elegant in their proportions, and will constitute a fleet which the nation may well be proud of.

Mr. Thomas B. Stillman has been indefatigable in his efforts to secure the very best ships that could be made by our ship-builders. The particulars of the hulls as regards length, depth and breadth are as follows:—Total length between perpendiculars, 130 feet; extreme width, 27 feet; depth of hold, 11 feet; and draft of water at load line, 9 feet. The vessels are all alike in this respect, are strongly fastened and are built of the best material.

The engines of these vessels are entirely new as regards their adaptation to the service in this country. Oscillating engines have been used for years, but not arranged in this particular manner. The neatness of the design, compactness of the details, and mechanical arrangement, generally, strikes the professional observer favorably, and much credit for them is due to Mr. I. V. Holmes, the superintending draughtsman at the Novelty Works, where the engines are now building. Mr. Holmes is a skillful draughtsman as well as a courteous gentleman, and we are indebted to him for many favors of a professional nature. The cylinders of these engines are 30 inches in diameter by 30 inches stroke, and are inclined to the propeller shaft, so that they work on it at an angle of 45°.

The cylinders are below the crank shaft, and on each side of it; and both piston rods are connected to one crank pin by single-ended connections; the cylinders being set slightly past each other so as to admit of this arrangement. The valve gearing consists of a double-ported slide valve, worked by eccentrics through link motion, and having a range of cutting off from three-eighths to three-fourths of the stroke: the exhaust passages being made large and free, so that little or no trouble is to be apprehended from back pressure. The air pump is worked from the end of the main shaft and sets on a bed plate outside the main frame, but close to it, and is driven direct by a crank and connecting rod from the shaft, as before stated. The bilge and feed pumps are set on the other side (fore and aft) of the frame, and are well arranged for accessibility and freedom of inspection at all times. The condenser is of the old-fashioned jet variety, and is ingeniously combined with the framing and bed plate. The whole space embraced by the machinery may be estimated at about 10 square feet. With all this compactness in the arrangement of the engines there is no confusion or complexity; no flanges cut off for clearance, pumps shorn of their proportions, columns chipped, or bolt holes half cut away, to save a sixteenth of an inch; but each part has a fair degree of freedom allotted to it, so that the machinery is at all times readily overlooked. It is a good feature to have the pistons work upward instead of down, as it avoids the nuisance of leaking stuffing boxes, which drip continually when under way or standing with steam up. The engines are geared, so as to drive the screw shaft 2½ revolutions for one that they make, and the gearing is simply a large wooden toothed spur wheel, gearing into an iron pinion. The screw

itself has a diameter of 8 feet, and is three-bladed, with an expanding pitch of from 14 to 16 feet. There are also the usual instruments attached to the engine, handsomely fitted in a frame, so that their indications can be seen at a glance. There is but one boiler, which has horizontal tubes and four furnaces. These engines, besides being artistically designed and put together in a workmanlike manner, will drive the vessels to which they are fitted rapidly through the water. It is hardly too much to expect that at least 40 revolutions of the engine shaft will be obtained, which will give upward of 100 revolutions of the screw and a little over 12 knots of 6,080 feet, minus slip of screw for the speed of the ship. This is mere speculation on our part, however, and we hope that even higher rates will be obtained. It will be interesting to notice the best results obtained by different lines in hulls with engines of similar power.

NEW WORK OF ART.

Mr. C. Schussele of Philadelphia, Pa., an artist of some distinction, has lately completed a large and beautiful painting, entitled "Men of Progress." It represents a group of some of the most distinguished American inventors, with a fidelity of portraiture which is in some respects remarkable. In order to place the work within the means and possession of the public generally, it has been reproduced on steel plate, by the celebrated engraver, John Sartain, and we now have a proof sheet before us. It is a noble picture.

In the center, upon a table, is one of Morse's telegraph machines, and grouped around are the various personages whose deeds and discoveries have rendered them illustrious in the eyes of the world. There is Morse, the father of telegraphy, conversing with Hoe of lightning press celebrity. Goodyear of rubber fame, Dr. Nott the oldest inventor and man of science now living, Ericson of iron-clad renown, Peter Cooper the benefactor, Professor Henry the scientific secretary of the Smithsonian Institute, Burden, inventor of horse-shoe machinery, Bigelow of carpet looms, Sickles of the steam cut-off, Jennings of friction matches, Blanchard of irregular lathes, Howe of sewing machines, Mott of works in iron, Baxter of mint and coast survey machinery, McCormick of reapers, Colt of revolvers, Bogardus of iron buildings, Dr. Morton of etherization—forming altogether a galaxy of representative men, whose citizenship is an honor to the republic.

It would be difficult to find a more interesting or more permanently valuable work than this splendid picture. We commend it especially to the attention of young mechanics and inventors. Nearly every one of these "Men of Progress," rose from obscure life and adverse surroundings. Their elevation was the result of their own honest study and unceasing perseverance—means which are within the reach of every one. We wish that the picture we have described could have a place in all the workshops of the land. It conveys to every beholder the most impressive lessons of hope and encouragement in all the worthy purposes of life. Mr. James M. Wattles is the agent for New York and Brooklyn.

NEW YORK WHARVES AND PIERS.

Mayor Gunther in his message, calls attention to the defective piers of the greatest shipping port on our continent. With the best water front of any city in the world, New York has perhaps the poorest accommodation for shipping. In his message, the Mayor says, respecting the wharves:—

"The condition and character of these structures are not in keeping, to say the least, with the commercial rank and destiny of the city. The present plan compels the continual outlay of large sums for dredging out the slips, that are rapidly filled by the material washed in from the streets and sewers, while the decaying nature of the timber frames causes a necessity for constant repairs. Most of the great commercial cities possess stone piers or extensive basins, constructed in the most solid manner that engineering skill can devise, while New York, second to none in importance; retains the old timber frames, filled in with rubbish and loose stones, a constant source of expense, deteriorating the harbor and affording lurking places for countless rats that infest the shipping and injure the cargoes. I would recommend the adoption of a policy gradually to replace the present

by stone piers. Solid stone walls laid in hydraulic cement might be built encasing the timber frames, increasing somewhat the breadth of the piers, and allowing a platform to be built outside and above the level of the roadway for carts. Thus in the course of a few years a complete renovation might be effected, greatly to the advantage of the city in appearance, and in the more positive benefits of sanitary improvement, the accommodation of commerce, and the saving of repairs."

These are sensible remarks. We recommended the construction of stone piers in place of the miserable wooden ones now in use, more than twelve years ago. And in conjunction with these, we have also recommended the construction of iron sheds on the wharves, for the purpose of shipping freight. Millions of dollars worth of property is damaged every year by the rains to which goods are exposed, while lying on the wharves after being discharged or before being shipped. Sheds, such as those on the Liverpool docks, should be erected on the New York wharves.

TURPENTINE AND BENZINE.

Three years ago turpentine could be purchased at prices ranging from thirty to forty-five cents per gallon, according to quality, and it was then extensively employed for mixing with paint—as a drier—and in the manufacture of a burning fluid, composed of four parts alcohol to one of camphene—purified turpentine. At present the price of turpentine is three dollars per gallon, and it is but little used. Burning fluid, which was a very dangerous substance, has happily gone out of use, and benzine—the light eupion oil, derived from petroleum—has taken the place of turpentine as a paint mixer. It is stated that it is superior to turpentine for this purpose. As its price does not exceed that of turpentine at its lowest figure, it is a subject of congratulation that it forms such an excellent substitute for it. But besides the uses stated of turpentine, it was also very extensively employed as a solvent for resins and asphaltum, in the manufacture of varnishes. In this department of industry, its place has also been supplied by benzine, which, although not quite so good, answers very well for the purpose. The oil springs of Pennsylvania have, therefore, not only been of vast benefit and advantage in supplying the cheapest burning fluid ever brought into use, but also in providing painters and manufacturers of varnishes with a cheap substitute for turpentine.

AMERICAN RAILROADS.

The number of miles of railroad completed Jan. 1, 1864, in the twenty-four loyal states is 24,926, but the total number completed and in the course of construction is 34,807 miles. The cost of their construction and equipment is \$1,025,115,742. So far as relates to the condition of the railroads in the rebel states we have but little information, yet it cannot be doubted that they are in a bad state, both as regards the permanent way and rolling stock. From apparently reliable accounts obtained from prisoners who had been conveyed over some of these lines, the tracks and engines seem to have become so depreciated, that trains cannot be run in safety at a speed over six or seven miles per hour. They will get worse before they get better while the war lasts.

Last year was the most prosperous on record for our Northern railroads. They were all taxed to their utmost capacity in carrying freight and passengers, and most of our city merchants believe that we have not a sufficient number of main lines for the business of the country.

Trow's Daily Calendar.

One of the most convenient as well as slightly calendars we have seen in a long time is issued by John F. Trow, 50 Greene street. It is decidedly novel in design, consisting of a number of slips of paper bound together, having the month, the day of the month and the week, in prominent figures and letters, also sunrise and sunset, high water, phases of the moon, time tables, &c.; these slips are torn off each morning, being arranged in regular order, so that the dates are correct. There are also historical facts under their respective dates, which are entertaining as well as instructive. In 1835, Jan. 1st, we are told that Charles Lamb died, which is all very proper indeed. In 1863, Jan. 2, Mason and Slidell were released from Fort Warren, which was decidedly improper; but on