

IMPROVED FOAM COLLECTOR.

One of the difficulties frequently met with in running steam engines, is the production of large quantities of foam which, being driven by the force of the steam into the steam-pipe, carries to the chest and cylinder considerable quantities of water, impeding the action of the engine, and sometimes breaking it in pieces. This operation has received the technical name of "priming," and various plans have been tried to prevent its occurrence. The one which we here illustrate is exceedingly simple, and would seem to be well calculated to accomplish its purpose.

It consists in placing two iron plates over the water, with their edges riveted steam-tight to the inner sides of the boiler, and their ends inclined downward to the ends of the boiler. These plates are represented in the annexed cuts, of which Fig. 1 is a perspective of the boiler partly broken away to show the inside, and Fig. 2 is a vertical section. The end of plate, *a*, rises over the end of plate, *b*, as shown, and a stop-cock is to be inserted in each end of the boiler, above the plate, for blowing off the foam. The gage-cocks are to be inserted into a pipe, *c*, one end of which enters the steam chamber of the boiler above the plate, *a*, and the other end passes into the water. The inventor advises that a little oil should be occasionally forced into the boiler to cause the water to foam and carry its impurities over upon the upper sides of the plates, to be blown out of the stop-cocks, and thus the collection of scale avoided.

The patent for this invention was procured (through the Scientific American Patent Agency) on the 6th of September, 1859; and further information in relation to it may be obtained by addressing the patentee, Thomas G. Gardner, at Elkhart City, Logan county, Ill.

AMERICAN NAVAL ARCHITECTURE.

THE SIDE WHEEL STEAMER "JOHN P. KING."

This beautiful side wheel steamer, just approaching completion, was constructed by Messrs. Westervelt & Son, foot of Houston street, East river, this city. Her owners are Messrs. Spofford & Tileston, this city, and the route of her intended service will be from New York to Charleston, S. C.

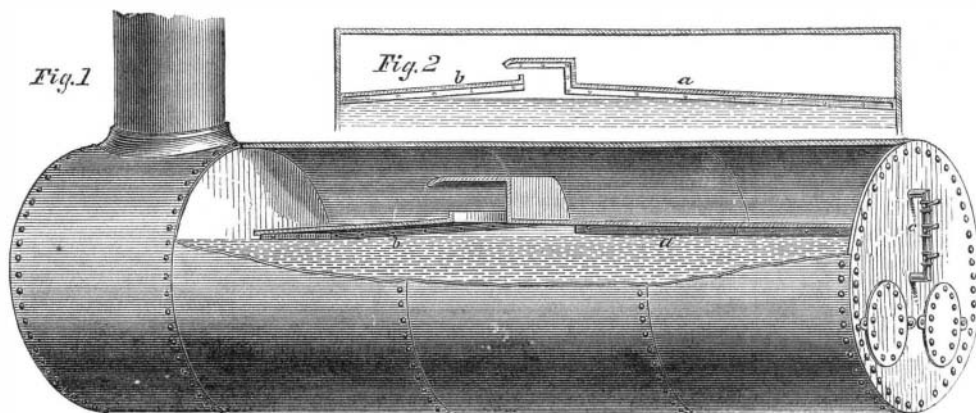
We herewith append full and minute particulars of her hull, &c.:—Length on deck, from fore part of stem to after part of stern post, above the spar deck, 235 feet; length at load line, 233 feet; breadth of beam at midship section, above the main wales (molded) 36 feet 6 inches; depth of hold 13 feet 5 inches; depth of hold to spar deck, 20 feet 9 inches; draft of water at load line, 12 feet; area of immersed section at above draft, 372 square feet; tonnage, 1,735 tons.

Her hull is of live oak, white ash, &c., and square fastened with copper, treenails, spikes and other materials. The floors are molded 15 inches, and sided 14 inches. Distance of frames apart at centers, 30 inches; frames are filled in solid.

The *John P. King* is fitted with one vertical beam engine; diameter of cylinder, 71 inches; length of stroke of piston, 12 feet; diameter of water wheels over boards, 28 feet; material of same, iron; dip of wheels 4 feet; length of wheel blades, 10 feet; depth of same, 1 foot 9 inches; number to each wheel, 24. She is also supplied with two return flue boilers, alike in every respect; length of boilers, 26 feet; breadth of same, 12 feet 3 inches; and their height (exclusive of steam chimney) is 12 feet 3 inches; number of furnaces to each, 5; breadth of these, 3 feet; length of grate bars, 7 feet 3 inches; number of flues above, 18; number of flues below, 15; internal diameter of those above, 8 of 13 inches, 8 of 11 inches, and 2 of 10 inches; internal diameter of those below, 1 foot 3 inches; length of flues above, 19 feet 4 inches; length of those below,

12 feet 6 inches; possesses one smoke pipe, fitted with spring slip joint; diameter of this, 7 feet; and height above grate surface, 6 feet; boilers located in hold, and have water bottoms; bunkers of iron; boilers have a grate surface equal to 225 square feet, and a heating surface of 5,422 square feet.

In addition to these features, the vessel is supplied with one independent steam fire and bilge pump, and has the ordinary cocks or valves to all openings in her bottom; ample protection against fire has been made; she has two masts, and is schooner rigged; all her cabins, state rooms, &c., will be fitted up regardless of cost, and we



GARDNER'S IMPROVED FOAM COLLECTOR.

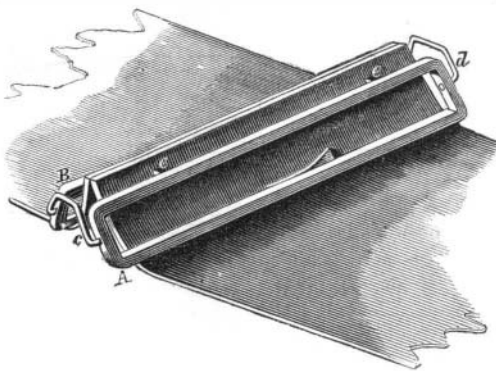
are assured that in this respect, this steamer will not be surpassed by any now running upon our coast.

The machinery of this vessel was constructed by the Allaire Iron Works, this city, and her name is in honor of John P. King, Esq., President of the Georgia Railroad. Captain Richard Adams, formerly of the *James Adger*, will command her.

FAIRFAX'S BELT COUPLING.

After all the belt couplings that have been invented, it is surprising to meet with an idea at once so simple and so novel, as has been embodied in the coupling here illustrated.

Two rectangular iron frames, A and B, are pivoted together at their ends by two wires, *c* and *d*, when the ends of the belt to be coupled are introduced between



them in the manner shown in the cut. It will be seen that the parts of the belt are held, not merely by the stout spurs, *e e*, on the frames, but that they are clasped and pressed together by the frames, so that the more strain is placed upon them the more firmly are they held together. The manifest advantages of this coupling are: first, its ease of application; second, not weakening the belt by perforation; third, its durability and consequent cheapness.

The patent for this simple and valuable invention was procured through the Scientific American Patent Agency, on August 21, 1860, and further information in relation to it may be obtained by addressing the inventor, Charles Fairfax, Jr., Cincinnati, Ohio.

To enamel iron articles, clean the surface; put on a composition of ground feldspar, quartz and borax; then fuse in a furnace. Black copal varnish may answer as a coating for cast iron articles that are exposed to water. This varnish must be made with linseed oil and asphaltum.

AGRICULTURE IN THE UNITED STATES.

We glean the following statistical data concerning the United States, its agriculture and manufactures, from a very able article by M. E. Dormoy, in the *Revue Contemporaine*. In 1783, at the period of the peace, the United States only comprised 802,230 square miles; at the present time they extend over a territory of 2,962,050 square miles, or nearly double the extent of Europe, exclusive of Russia. Out of a population of 3,400,000 males of the age of fifteen and upwards, 45 per cent are agriculturists; while those engaged in commerce, manufactures, trades and mines do not together form more than 30 per cent; 2 per cent are devoted to a seafaring life; while the army scarcely claims one per thousand. These proportions differ widely from those of Europe, since in England not more than 15 per cent are agriculturists; in France, 23 per cent; and in Belgium, 25 per cent. The capital engaged in agriculture amounts in the United States to 5,200 millions of dollars; while that employed in other branches of industry does not exceed 1,000 millions of dollars. Every year agriculture adds 16,-

600,000 dollars to the wealth of the country, and in the State of New York alone agriculturists pay four-fifths of the taxes. In 1857, the total exports from the United States amounted to 360,009,000 dollars, of which sum agricultural produce formed two-thirds, including cotton, which alone stood for one-third. In the course of ten years the value of these exports had increased 70 per cent. In the United States the average extent of a farm or estate is from 150 to 200 acres; in France it is not more than 12½ acres; while four millions of small farmer do not own more than from 6¼ to 7½ acres. Maize constitutes the chief staple of the United States, since it occupies nearly one-third of the land under cultivation, or 30 millions of acres; 20 millions of acres more consist of uncultivated pasture land, incapable of producing hay; 12½ millions are meadowland; oats are grown on 7½ millions of acres, and five millions of acres produce cotton. The vine covers 250,000 acres. The four chief sources of revenue to the Union in the way of annual produce are—maize, producing 300 millions of dollars; hay, 140 millions; wheat, 100 millions; and cotton 80 millions. The number of horses, asses and mules is estimated at five millions, or one of those animals for every five inhabitants; there are 18 millions of oxen, 30 millions of pigs and 20 millions of sheep. The total value of all these domestic animals is about 600 millions of dollars.

EXPERIMENTS AT THE METROPOLITAN MILLS.

Messrs. Editors:—In your paper of the 6th inst., you state that the engines at the Metropolitan Mills yield only about one-seventieth of the power of the fuel. This statement is doubtless based on the tables published in the daily papers of the experiments at 239 Cherry street, some of which gave 14 lbs. per horse power per hour. Since seeing your article I have calculated the consumption at the Metropolitan Mills, during the experiments alluded to, and find that it was less than 4 lbs. per horse power per hour by the indicator. In regard to the strangling of steam, the pressure in the cylinder was within 5 lbs. of the pressure in the boiler.

W. ROWELL.

A PHILOSOPHER TO THE LAST.—M. Retzius, we hear, died in the full pursuit of science. On his dying bed he made his observations on the progressing dissolution of his own body. "The struggle of death is hard," he said to those about him; "but it is of the highest interest to note this wrestle between life and death: now the legs are dead; now the muscles of the bowels cease their function; the last struggle must be heavy, but for all that it is highly interesting." These were his last words.