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UNITED STATES SCREW STEAM CRUISER ATLANTA.

During the last session of Congress the construction of the smaller of the two cruisers provided for in the act of 1882 was reauthorized, and in addition two cruisers of about 3,000 tons displacement and one dispatch boat, for which $1,300,000 were appropriated. Mr. John Roach, of Chester, Pa., the lowest bidder, obtained the contracts.

According to the act of Congress, these vessels were to be "constructed of steel, of domestic manufacture, having as near as may be a tensile strength of not less than 60,000 pounds to the square inch, and a ductility in 8 inches of not less than 25 per cent."

We present, on this page, an engraving of the single screw steam cruiser Atlanta.

The contract price for the hull, machinery, and fittings, exclusive of masts, spars, rigging, boats, etc., was $618,000.

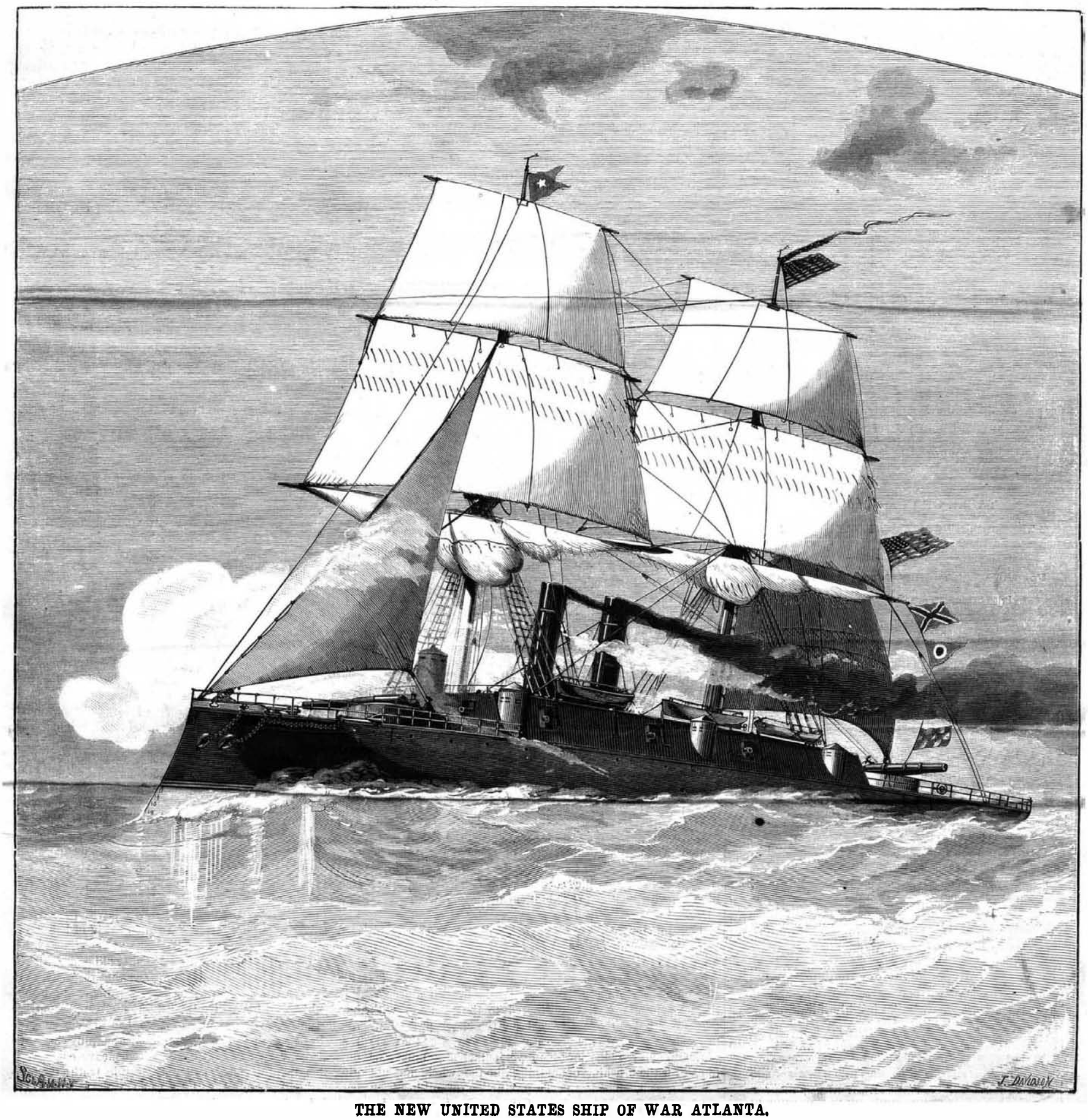
This steamer will have the following dimensions:

Length between perpendiculars	270	feet.
Length on water line	276	"
Length over all	283	"
Depth from garboard strake to under side of superstructure deck	34	"
Height of main deck port sill from load water line	11	"
Free board at extremities of superstructure	9	"
Breadth—extreme	42	"
Draught at load water line, mean	16 feet 10 inches.	
Displacement at water line	3,000 tons.	
Area of plain sail	10,400 square feet.	
Complement of men	230	"
Battery, four 8-inch and six 6-inch B. L. R.		
Indicated horse power	3,500	
Sea speed	13	knots.
Capacity of coal bunkers	580	tons.

There will be eight complete transverse bulkheads extending to the main deck, dividing the vessel into nine main compartments, one of which is occupied by the engines. Longitudinal bulkheads will extend on each side throughout the machinery space, forming side coal bunkers, which afford a coal armor of about 8 feet in thickness above the water line and an average thickness of about 5 feet below it. The coal bunkers will have a capacity of 580 tons, but nearly 200 tons more can be safely carried, thus giving an endurance of 2,500 miles at full speed and 5,300 miles at 10 knots an hour.

The vessel will be divided into seventy-three water-tight compartments, and great care has been exercised in arranging the openings in order to make them really water-tight, the doors being arranged for manipulation either from below or from the main deck.

(*Continued on page* 308.)



THE NEW UNITED STATES SHIP OF WAR ATLANTA.

UNITED STATES SCREW STEAM CRUISER ATLANTA.

(*Continued from first page.*)

The drainage has been closely attended to, and the total pumping power of the steam and circular pumps, with capacity of 2,500 tons per hour, can be concentrated on any main compartment. In addition there will be six continuous acting hand pumps on the berth deck, which will have independent suctions to each main compartment and each compartment of the double bottom; they can be used for flooding any compartment or flushing the drain pipes, and will deliver into the fire main or directly overboard as may be required.

The machinery spaces, for 100 feet, will be protected by a steel deck, 1½ inches thick, and this deck will be so placed with reference to the water as to afford the maximum protection to the buoyancy. The deck is to be stiffened at the sides by transverse frames in the lower coal bunkers, the brackets in the upper, the fore, and aft coal bunker bulkheads, and amidships by deep I-beams. An inner bottom will extend the length of the machinery spaces, forming a watertight double bottom containing twelve watertight cells. All of these cruisers will be fitted up with bilge keels.

The outside plating will be 23 pounds per square foot, with a double plate at the water line from the stem to near the stern. The fixed ammunition and shell rooms and the magazines are to be in the hold amidships, directly before and abaft the machinery space.

The motive power will be obtained from a three cylinder, compound, horizontal, back acting engine of 3,500 indicated horse power. The engine will have one high pressure cylinder 54 inches in diameter, and two low pressure 74 inches in diameter; the stroke being 42 inches. The cylinders will be located with their axes parallel, 9½ feet apart, on the starboard side of the vessel. The crank shaft will be made in three interchangeable sections secured to the line shafting and to each other by couplings forged on the shafts. The low pressure cylinder cranks will be set at right angles, and the crank of the high pressure cylinder will be set between the others at angles of 135 degrees. The shaft will be steel 16 inches in diameter at the main journals.

The screw will be 17 feet in diameter with a mean pitch of 20 feet, will have four adjustable blades, and will be made of steel.

Steam will be furnished by eight horizontal return tubular steel boilers placed forward of the engine and divided into two sets by a watertight bulkhead athwartship. Each boiler will be 9¾ feet long, 11⅜ feet in external diameter, and will have two cylindrical furnaces 43 inches in internal diameter, made of corrugated steel.

The disposition of the battery is thus described by Assistant Naval Constructor F. T. Bowles, U. S. N., Secretary to the Naval Advisory Board, in a paper presented to the United States Naval Institute, and from which the above items were condensed: "Outside the forward port angle, and the after starboard angle of the superstructure, an 8 inch long rifled gun will be mounted in a barbette about 3 feet high, built of 2 inch steel plates. The forward gun has a train from 40 degrees abaft the beam on the port side, sweeping the whole deck forward to 30 degrees abaft the beam on the starboard side; similarly for the after gun. Within the superstructure six 6-inch B. L. R.'s will be mounted; two, on each broadside, with a train of 60 degrees before and abaft the beam; one, forward in the starboard angle of the superstructure, may fight either through a forward or a broadside port, giving a total train of from 20 degrees across the bow to 60 degrees abaft the beam. The remaining gun is similarly mounted on the port side aft."

Fall of the Wisconsin Capitol.

The disastrous effect of pushing work on masonry so rapidly that the mortar has not time to set before being subjected to an excessive load, was most painfully illustrated at Madison, Wis., on the 8th inst. Work on the second story of the balcony of the south wing of the new capitol building was being hurried, in order that the building might be closed in before cold weather came. The "green" mortar had not acquired strength enough to withstand the pressure, and as a natural sequence the wing fell with a crash, killing four men outright and more or less seriously injuring nineteen others. Although mortar takes a long time to attain its full strength, it becomes, in a comparatively short period, strong enough to bear a heavy steady pressure; and when we consider that this fact is well known to builders, the custom of rushing up a structure cannot be too emphatically denounced. Because this plan is being pursued every day with impunity is no excuse; the practice is dangerous.

The Greek Sponge Fisheries.

The Greek sponge fisheries have been very much developed within the last two years, and at the present time there are 723 boats, 183 of which are provided with diving bells, employed in this business. These boats, which carry from five to seven men, nearly all belong to the ports of Hydra, Egina, Cranidi, Hermione, and Trikeri. The fishing season commences in April and ends in August, the boats which are provided with diving bells going as far to sea as Tunis and Tripoli, while the others do not go beyond the coast of Greece and Crete. The value of the sponges taken during the past season is put at £96,000, nearly half of which is credited to the Hydra boats, while those from Egina took about £27,000 worth of the remainder.

Work and Hurry.

Mr. Herbert Spencer thought that the most valuable piece of advice he could leave us in departing from our shores was to be less restless—to work less and play more. Overwork was the besetting sin of Americans, according to that English philosopher, who spoke with the more feeling and the stronger emphasis on the subject because he himself was a victim of the very excess against which he warned us. He had come to the United States, in truth, with the hope of restoring tone to his nervous system, so shattered by indiscreet application to study that he was unable to sleep soundly.

Sensible people here, however, knew very well that working too hard was not an American vice. It is rare to find an American whose tendency to sin takes that direction. The men who complain most of overwork are usually those who are unfitting themselves for exertion by bad habits of self-indulgence. They could do their work without undue strain if they did not otherwise overtax their nerves.

But there is another very frequent cause of nervous prostration. It is hasty and unmethodical labor, the habit of hurrying. But that cause, it seems, is commonly active in London no less than in New York.

The London *Lancet* warns the "city men," that is, the business men, that they are wearing themselves out with unnecessary hurry and bustle. It also tells physicians that they would do far more to prevent the spread of nervous disease if they undertook to cure this vicious mental habit, than they can hope to do by dealing only with the particular ills which come from it.

One of the chief characteristics of business life, the *Lancet* says, is to be always in a hurry. The moment a lad enters a business house "he begins to make believe to others, and too quickly to himself, that he is overwhelmed with work. The result is the formation of a 'mental habit' of hurrying, which before long becomes the keynote and motive of the whole life. It is the custom to write and speak as though commercial men were really as much pressed for time as they pretend to be. Now, the simple fact is that all their haste and turmoil, prejudicial and often ruinous as it is, is artificial."

The bustling, hurrying man, as a matter of fact, is a poor worker, and accomplishes comparatively little in a day. Too much of his steam power is expended in kicking up a dust. The habit of hurrying and of feeling in a hurry is fatal to good work, and diminishes the amount of work a man can get through with. The friction is too great. So little of practical value is accomplished, despite all the superfluous expenditure of energy, that he cannot go home at night with the sweet consciousness of duty done, of a day's work completed. He has left too many stitches to be taken up.

The men who accomplish the most never seem in a hurry, no matter how much they have to do. Everybody must have observed that. They are not troubled for lack of time, for they make the most of the minutes by working in a cool, clear, orderly, and methodical fashion, finishing each job properly, and not wasting their nervous force on trifles or expending it in bustle. They never complain of overwork. They are more likely to be hunting up new work to do, in order to give their faculties more varied employment and to exercise some which are not sufficiently used.

Too much work to do! The highest pleasure and greatest satisfaction are found in work only, and the more work a man has to do, if it is work to which he is adapted, the better he likes it. The men to pity are those who can get nothing to do, and those whose only business is to hunt for pleasure for itself—the fellows who have no other occupation than that of killing time. But we are also sorry for the men, whose manner, as described by the *Lancet*, suggests a boiler worked up to the highest pressure and only saved from bursting by frequent letting off of steam.—*N. Y. Sun.*

Underground Telegraphy.

A successful trial of a new system of underground telegraphy was lately made in Philadelphia, according to the *Press* of that city. The system is that controlled by the Brooks Underground Conduit Company, of Delaware, which has now in operation a subterranean pipe containing thirty-three wires from Third and Chestnut Streets to the depot of the Pennsylvania Railroad Company at Kensington, a distance of two and a half miles. The cable is laid eighteen inches underground, and the old difficulty heretofore experienced in running telegraph and telephone wires in the same duct is obviated. The Western Union has ten of its New York wires in the pipe to Kensington, which are being used for transaction of ordinary business. The conductors are immersed in paraffine oil to keep out dampness. The outer covering consists of lead. It is claimed that electric light wires can be carried by this system, and the cost of introducing them into houses will not exceed that of putting telegraph and telephone wires into buildings.

Yellow Ocher.

At Bermuda, Va., on the Appomattox River, about one thousand tons of yellow ocher are annually taken, at least one-third of all the fine ochers used in the United States, a large portion of our supply coming from France. The Virginia deposit contains about ten per cent of sand or grit, which must be washed out before the ocher can be ground and bolted, but the French ochers are so pure as not to require washing.

Final Effects of Bacteria.

After a couple of years of cultivation and growth of bacteria, using about one hundred homœopathic vials, with various animal and vegetable infusions as commonly made, it appears that in all cases the material wrought upon is never left alone till it is fully decomposed as an organic substance and resolved back into its simple constituents.

Although many kinds of bacteria in many cases assisted each other in the work of disorganization, yet the main work was done by the *B. termo*, which greatly outnumbered, overpowered, and destroyed all before it, including other dead, unencysted bacteria, or even its own dead.

Could an average proportion of bacteria, bacilli, micrococci, and spirilli be made, it would stand about as 90 : 10 : 10 : 5; yet these varied very greatly in vegetable infusions, some forms appearing only transiently, and of the first named ninety-nine hundredths were *B. termo*. Some infusions were longer in being changed, as circumstances were more or less favorable; but in all cases, when the work of decomposition was fully finished, only an impalpable gray powder or sediment remained, with a beautifully clear and apparently pure liquid above.

How this beautifully clear liquid could be obtained from such a putrid mass is a mystery, and, strange to say, both sediment and liquid were free from smell, although some of the vials had been kept tightly corked, except to be examined occasionally.

This fragmentary experiment goes to show that these organisms properly hold their sphere between the living and the dead, to prepare new material out of the old for the immediate demands of new and subsequent organic life.—*J. M. Adams, in the Microscope.*

Proposed Employment for our Naval Engineers.

In the annual report of the Bureau of Steam Engineering, the principal facts of which have just been published, it is recommended "that assistant engineer officers be more generally utilized in navy yards as heads of the several shops for which their profession fits them. The expense for salaries for master workmen or foremen would thus be saved in many instances." This recommendation, however, seems hardly consistent with a paragraph further along in the report, which reads as follows:

"The difficulty of securing engineer officers for each ship in service has already made itself seriously felt. With the number of assistant engineers fixed by the act approved August 5, 1882, it is impossible to properly officer our ships in the Engineering Department. To intrust the watches to the young naval cadets, except they may have had special training therefor, or to the present finishers, is but to invite disaster, and the occurrence of some great calamity can only be a question of time. If the lives of the officers and men of the Navy are of less consequence, or if the care of the machinery of our vessels of war is of small importance, then such a system needs no criticism."

We should think that if it was already difficult to obtain good engineers for necessary duties on shipboard, it would hardly be policy to try and "utilize" any of the present available officers by making them heads of machine shops on land. The report adds that the various shops under the control of the Bureau are in good working order, and calls attention to the superiority of mild steel to iron in boiler construction.

Look out for Leaks in Ammonia Ice Machine Pipes.

The cellars of a Cincinnati brewery are cooled by ammonia gas, carried through them in pipes. A leak recently occurred just outside the cellars, and the gas was set free under the stables, forming, in the moist atmosphere, hydrated ammonia, intensely corrosive to animal tissues. In a few seconds this began to act upon the lungs and eyes of the horses, and 66 of them were soon dead or dying. Even some street car horses passing were said to be so powerfully affected that they fell to their knees, and were with difficulty roused to drag a car and its passengers out of danger. One man, standing near the stable door, was seen to fall, but was rescued by those who had noticed it from a distance. This singular accident should impress upon those who have the management of ice machines the necessity for great care and watchfulness, that we may not some day have an accident in this line as serious as the blowing up of a steam boiler can sometimes be.

Propagation of Carp.

The water was recently drawn off from a carp pond at Washington, located between the White House and the Potomac River, used by the Fish Commission for propagating purposes. This pond covered about five acres, the water being shallow, as carp do not require great depth. When the water was reduced to a narrow stream crossing the pond, the fish were scooped out with nets, transferred to tubs, and having been carefully counted, were ready for shipment to such points as Prof. Spencer F. Baird, the Commissioner of Fish and Fisheries, had directed. The increase had been 65,000 in one year. The fish taken were varied in size from the minute specimens half an inch or less in length to those of two or three pounds in weight. They were principally mirror carp, having a few scales along the back, but there were in their company not a few leather carp and an occasional hybrid and tench.