

his business successfully, to grind the spices himself. Some spices (especially pepper) should only be crushed, and the husks separated by a sieve. Cayenne pepper is adulterated and colored with red lead; he had known a case of lead colic produced by eating such pepper. Spices should not be put up in papers.

The President—Every article should be labeled with its proper name, quality and the name of its manufacturer. A law requiring this of all articles to which it would be practicable is perhaps the extent of useful legislation against adulterations.

The subject for the next meeting—"The Means of Conveyance to and from New York"—was then agreed upon, and the association adjourned.

AMERICAN NAVAL ARCHITECTURE.

[Reported expressly for the Scientific American.]

THE STEAMER "R. R. CUYLER."

The *R. R. Cuyler* has been completed only two or three weeks, and at the time of our writing has made but one trip to the port of her intended service; yet this limited trial, in which the many improvements introduced in her erection were thoroughly and properly tested, gave the greatest of satisfaction to all that were interested in her success. Full particulars relative to hull and machinery will be found annexed:—Length on deck, 235 feet 6 inches; breadth of beam (molded), 38 feet; depth of hold at beam, 17 feet 6 inches; depth of hold at spar deck, 23 feet 3 inches; draft of water at load line, 15 feet 6 inches; length of engine space, 66 feet 3 inches; area of immersed section at load draft, 548 square feet; tonnage, 1,600 tons. Her frame is of white oak and chestnut, and square fastened with copper and treenails; distance apart at centers, 24 inches, and filled in solid for length of whole floor; secured by iron straps double and diagonally laid, 4 by $\frac{5}{8}$ inches; cross floor (molded), 14 inches, and sided 10 and 12 inches.

The *R. R. Cuyler* is fitted with a vertical direct engine; diameter of cylinder, 70 inches; length of stroke of piston, 4 feet; diameter of propeller, 16 feet; length, 4 feet 9 $\frac{1}{2}$ inches; pitch of same, 22 feet 6 inches, and has 4 blades.

She has two horizontal tubular boilers; length, 17 feet 5 inches; breadth, 13 feet 6 inches; height, exclusive of steam chests, 13 feet 9 inches. They have 6 furnaces, the breadth of which is 3 feet 11 inches; length of grate bars, 7 feet 8 inches. The number of tubes in these boilers is 288; internal diameter of same, 4 $\frac{1}{2}$ inches; length, 14 feet 5 inches. Diameter of chimney, 4 feet 3 inches; height of same above grates, 21 feet. The boilers possess a heating surface of 6,258 square feet; capacity of bunkers in tons, 170. Average revolutions, 36; depth of keel, 12 inches; does not use blowers to furnaces; boilers located in hold; one smoke pipe; one independent steam, fire, and bilge pump; one bilge injection, and bottom valves or cocks to all openings in bottom; two masts, foretopsail schooner rig; has an independent rudder post.

She possesses two decks for freight, above which is the large and comfortable cabin, capable of accommodating in the best manner 220 passengers, with berths and state rooms. Above this cabin is situated the spacious dining saloon, the ladies' saloon, various pantries, and officers' quarters. The upper saloons are paneled in oak, and the lower cabin is beautifully furnished; the entire woodwork being polished white and gilt. Broad flights of stairs connect the two saloons.

This steamer cost about \$142,000, and composes, with three other vessels, the line running between New York City and Savannah, belonging to H. Cromwell & Co. The hull was built by Samuel Sneden, of Greenpoint, of the best material and in the most substantial manner. Builder of engines and boilers, the Allaire Works, this city.

STEAM FERRY-BOAT "PACIFIC."

Within a few weeks the Union Ferry Company have added another splendid boat to their many others, and it is now running on the East river, between Whitehall-street, this city, and Atlantic-street, Brooklyn. Below will be found some of the particulars of hull and machinery:—Length on deck, 180 feet; breadth of beam (molded), 33 feet; depth of hold to spar deck, 14 feet; draft of water at load line, 6 feet 3 inches; tonnage, 650 tons. Her frame is of white oak, chestnut, &c., properly and securely fastened with rivets and treenails. Built in 1859; has one independent steam, fire,

and bilge pump; one bilge injection; does not use blowers to furnaces; one smoke pipe; water bottom to boiler. Is fitted with condensing engine and drop; flue boiler; built by Neptune Iron Works, this city.

She is protected from communicating fire by having felt on boiler, space above same, and iron around chimney. Her bows are sheathed; has water wheel guards, fore and aft. Splendid saloon cabins on side one anchor and two life-boats.

THE STEAMER "PERUANA."

This steamer, a fine and complete specimen of naval architecture, has just reached completion, and is now making her first trip to the ports of her intended service, on the coast of Peru. Subjoined will be found minute particulars of hull, engine, and boilers:—Length on deck, 180 feet; breadth of beam (molded), 29 feet 6 inches; depth of hold, 11 feet 3 inches; depth of hold to spar deck, 7 feet 3 inches; length of engine and boiler space, 65 feet; area of immersed section at load draft of 6 feet, 169 square feet; tonnage, 560 tons.

Her frame is made of white oak, chestnut, and hacket, and square fastened with copper and treenails; the frames are filled in solid, distance apart, 31 inches; cross floors (molded), 12 inches, sided, 7 $\frac{1}{2}$ inches, and these are secured by double laid and diagonal iron straps, 4 $\frac{1}{2}$ by $\frac{5}{8}$ inches.

The *Peruana* is fitted with a vertical direct-acting engine; diameter of cylinder, 44 inches; length of stroke of piston, 11 feet; diameter of waterwheels (over boards), 27 feet; length of boards, 7 feet; depth of same, 22 inches; number of blades, 24.

She has two return flue boilers; length, 24 feet, 6 inches; breadth, 8 feet 6 inches; height, exclusive of steam drum, 8 feet 3 inches; number of furnaces, 2 in each boiler; length of grate bars, 6 feet, 9 inches; have 10 flues in each boiler, whose internal diameters are 15, 16 and 12 inches; length of flues, 20 and 14 feet. The smoke pipe extends 32 feet above grates; bunkers, made of wood; capacity of same, 120 tons, and the daily consumption of coal is expected not to exceed 12 tons.

Her maximum pressure of steam is 25 lbs.; maximum revolutions at this pressure, 18; the boilers are located in the hold; does not use blowers to furnaces; she has 3 water-tight bulkheads, and a large and pleasant cabin on deck; water wheel guards fore and aft.

In addition to these she is fitted with one independent steam, fire, and bilge pump, one bilge injection, and has bottom valves or cocks to all openings in her bottom; and is protected from communicating fire from the boilers by felt and sheet iron. Builders of hull, J. Westervelt & Sons; builders of machinery, Morgan Iron Works. The vessel is owned by Charles A. Dimon and others.

IRON AND WOODEN SHIPS.

MESSRS. EDITORS:—On page 131, of the present volume of the *SCIENTIFIC AMERICAN*, you propose to enlighten your readers on the subject of naval architecture—a most praiseworthy purpose—but, alas! they are doomed to disappointment, unless the editors change their course, and give their readers something more than the opinions of "eminent ship builders," as quoted on page 180.

Every reader of your journal knows that you are favorable to iron ships, and that you give them the preference over those built of wood; but who has ever found in your journal one single reason why iron ships should have the preference in this country? The "eminent shipbuilder" to whom you refer has an object in view, beyond his country's good. If you will permit him to come to the witness-box it will be shown through the *SCIENTIFIC AMERICAN* that it is not for the best interests of the United States that her merchants should go into iron shipbuilding, except for river navigation, where the lightest draft of water is demanded. Is it not because ships are not remunerative that our shipyards are idle? If a wooden steamship of a given size, costing \$200,000, will not pay, will she pay if built of iron, of the same size and capacity, and costing \$250,000? Does the increased cost make her more profitable? Again, we are told that they are stronger than wooden ships; does the increasing list of shipwrecks of iron-built ships prove it? Does it not rather prove the converse to be true? That iron may be more fully represented in the construction of this noble fabric, we fully admit, but deny that it is the best material of which to

build the external of the hull; and we think the editors will agree with us, if they will give the subject a fair amount of investigation. Why does England build iron ships? Is it not in conformity with her best interests to export her iron in a manufactured state, and would she not build her ships of wood if she could get it without importing it? Undoubtedly she would? It has always been her policy (and should be ours) to sell more than she buys, and, when one of her staple products has become exhausted, to substitute something else, so that her commercial policy may be maintained. And when the people of the United States shall have learned that the perfection and manufacture of wooden ships is one of the most profitable of all our exported fabrics, then we shall discover whose interests the "eminent shipbuilders" and iron-workers are advocating when they talk of iron ships. May we not hope that you will allow this subject to be ventilated through the columns of your journal? Although your humble servant may lay no claim to "eminence" as a shipbuilder, yet he will pledge himself to show that either ignorance or avarice forms the basis of all projects for substituting iron for wood in the outer shell of our ships. If the "eminent shipbuilders" will labor as assiduously to improve the models of American ships, as they have to favor British policy and British interests, we should find even England herself willing to admit that *not Britannia but Columbia* rules the waves. JOHN W. GRIFFITHS.

Navy Yard, Philadelphia, Pa., March 17, 1870.

[An answer to the above will be found on page 217. We are positive that the last clause of the above is an unwarranted insinuation against the patriotism of our shipbuilders. We are confident that the charge of any one of them having labored assiduously to favor British policy and interests cannot be sustained.—EDS.]

ENGLISH LOCOMOTIVES ON A "BENDER."

An amusing case recently came before the Court of Queens Bench at Westminster; we find it reported in full in the *London Times*:—The plaintiff in the action, James Washington Myers, was by birth an American, and had acquired considerable celebrity in England by his equestrian performances. His services were in great request, and for some time he served under the auspices of Messrs. Hawes & Cushing, at the weekly wages of 45 shillings. In the Spring of last year these gentlemen offered to increase his weekly allowance if he would continue with them; but having the "Young America" spirit in him, he declined the offer and started a company on his own account, with which he traveled from place to place, giving performances. When about to "go the circuit" the plaintiff's attention was attracted by an advertisement of "Bray's Patent Traction Engine," designed for draw-carriages &c., upon the common road by steam power, instead of the ordinary means of locomotion by horse-flesh. It occurred to him that if he could get one of these engines to answer his purpose, it would both save the expense of horses in carrying his "Pavilion" round the country, and would at the same time "astonish the natives," and act as a grand advertisement of his exhibition. Accordingly, he applied to the defendants' company, and on the 16th of June, Mr. Hanson, the secretary, wrote him a letter saying that he thought it could be arranged to let him have an engine, but as the directors had two other proposals before them, he must decide by the next day. He accordingly attended the board the next day, and told the directors what he wanted the engine for; and that if it would not go at the rate of seven or eight, or six miles an hour, it would be of no use. They said it would go seven or eight miles an hour with great ease, and would carry 20 tons at seven miles an hour, though they would not like it to go at that speed, but it would go five miles an hour well. The plaintiff told them he did not want to go more than five miles an hour. The next day the draught agreement was sent to him, but it contained a stipulation that the plaintiff was not to work the engine more than three miles an hour, and as that speed would be of no use, he altered the "3" to "5," and with that alteration the company executed the agreement under their seal. The agreement was dated June 21, 1859, and by it the defendants agreed to let the plaintiff their traction engine "No. 1" for three months from July 11, 1859, at the monthly payment of £65, to include engine-driver's and steerer's wages. As the engine was to be made an advertisement, the plaintiff gave directions that it should be painted with all the colors of the rainbow, and he

placed on the top of it a huge dragon painted green. He also gave instructions that all the country through which he intended to progress should be posted with gigantic pictures of his procession, and that his arrival should be made extensively known by advertisements in all the towns and cities through which he was about to make his circuit. The monster engine after one preliminary break down, was delivered to him at the Pavilion, in Whitechapel, on the 9th of July; and on that day the plaintiff and his troop in five vans, drawn by the engine "No. 1," started for Camberwell. It took seven hours to reach Camberwell, and the driver accounted for his slow progress by saying it was necessary to go slowly in order not to frighten the horses in the streets. From Camberwell it took 10 or 11 hours to reach Croydon, though the engine had only 11 tuns to draw. On entering Croydon the procession was formed in the midst of a large and wonder-gaping crowd, but all at once the engine stood still, the reason assigned for which was, that the waterpipe was putting the fire out. The people began to hiss and hoot, and the plaintiff got away to his hotel, and after his performance came up to town and saw Mr. Hanson. Another engine, "No. 4," was then sent down as a substitute, and with that the plaintiff started to Bromley, and next day to Dartford, where "No. 4" stood still in the middle of the road. The steerer said one of the pumps had got out of order, and it was impossible to go on that day. The plaintiff could not perform at Dartford, and came back to London, and saw Major Campbell, one of the defendants, who said he was very sorry, and told him to go back and get horses, and the company would pay for them. He accordingly got horses, and went to Dartford and Gravesend with his company, and performed. In consequence of the delay thus occasioned, the plaintiff said he was unable to keep his engagements; and the great expense which he had incurred in advertisements and procuring large colored posters from New York was thrown away. The engine "No. 4" rejoined the plaintiff "on circuit" at Rochester; and on leaving that city for Maidstone, "No. 4" took a start down a hill at the rate of about 60 miles an hour, but was stopped by running against a bank, breaking several of the carriages. The plaintiff left the engine on the road, and went on to Maidstone with horses, and then came up to London and explained to the directors what had happened. It was then arranged that the plaintiff should have William Bray, the son of the inventor, as his driver; the previous driver being considered incompetent, and eventually William Bray made his appearance at Tunbridge Wells with a new engine, "No. 6." Affairs went on pretty well for about a fortnight; but when the "circuit" arrived at Dover some difficulty was made by the turnpike man about the toll. On one occasion the plaintiff said he had been compelled to pay as much as £11 for toll; but when he arrived at Dover he took the precaution to go into the town and consult an attorney as to the amount of toll which could legally be demanded, and being informed that 4s. 6d. was the legal toll he tendered that sum. The gatekeeper, however, was not satisfied, and refused to open the gate; and thereupon the plaintiff, being determined to "go ahead," ordered the engine-driver to drive through the gate. This was accordingly done, as the gate presented but a feeble resistance to the monster engine; and the plaintiff of course, got involved in some legal disputes. The next mishap occurred in Brighton, where the procession was then making the parade of the town. On that occasion the crank-shaft broke. This obliged the plaintiff to come to London to get a new shaft, and again to hire horses to Worthing and Chichester. The engine went all right to Winchester, but there the water put the fire out. During this period the plaintiff wrote frequent letters to the defendants and complained of the engine as useless, but he still took it on with him, though it was unable to do more than carry itself along. The plaintiff went to Basingstoke and Newbury, at which latter place the engine became a wreck, and the plaintiff came up to town to see the defendants on the subject. On the 19th of September for the first time, the defendants complained that the plaintiff had not used the engine fairly, and a correspondence took place by letters and by telegrams. The engine was repaired at Newbury, and was got to Swindon, but on going down Swindon-hill it was thrown aside on a bank. The plaintiff was tossed into a thicket and the stoker into the fire-hole. It was then sent on

by rail to Cheltenham, and finally it arrived in Birmingham in the beginning of October, where it was still kept by the plaintiff on account of money which he said the company owed him. The plaintiff stated that on the day before the trial the engine "No. 4" had been brought down to New Palace-yard, and that it took seven minutes and a-half by his watch to get it across the gutter.

On cross-examination the plaintiff stated that he had been two years in England, and this was the first expedition which he had taken on his own account. His vans were from 10 to 11 tuns only. He persisted in his statement that the directors said the engine would go five miles an hour, and that he never heard three miles mentioned. He admitted that he was anxious to have the engine, and that on the day he signed the agreement he heard that Mr. Collum had one of them, but he did not go to see it. The plaintiff was then cross-examined as to his having seen a copy of a letter which the defendants had written to Mr. Cooke, of Astley's, to the effect that the company would not incur any legal liability in respect of the engine, as the proposed application of it was a novel one; but he positively denied that any such letter had been shown him by the directors. He was then cross-examined as to his performances, and stated that he lost several in consequence of the slowness of the engines; but he at the same time admitted that some of his performances were very successful. Mr. Hanson had told him "No. 6" was a new engine, and had not been tried, but he did not say he must take it at all risks. He told the company it would be worth £10,000 to them as an advertisement, as he should take it to all the principal towns in England; and he might have said it was worth £200 to himself in each town as an advertisement. The plaintiff was made to tell the story of his charging through the tollgate at Dover, and then taken through the various particulars of the damage which he claimed. One head of claim was for £3,000 for "damage to reputation;" and he said, when questioned on that point, "Well, Sir, I would not take £3,000 for my reputation," and that he could not show himself again in the towns where he had failed to keep his engagements. He said the best part of his journey was the road into Portsmouth, on which he traveled 18 miles in about nine hours. He gave an account of what he called a "Yankee trick," which he had played upon a person named Croft. When he found it was impossible to go on to the next place, because they could not get up the steam, he got Croft to give him £40 to stay and perform the next day. He said he had no intention of leaving England, though his "last appearance previous to his departure for America" had been advertised, but that was only a customary form adopted when it was wanted to draw a full house.

After considerable discussion it was agreed that there should be a verdict for the defendants on the count in the declaration alleging fraud, and that a verdict should be taken for the plaintiff upon all the other counts, subject to a reference.

A CAUTION TO TRAVELERS.—Many persons, in passing from one car to another, while a train is in motion, are accustomed to steady themselves by grasping the horizontal wheel used for winding-up the brake, which projects above the railing on the platform of the car. This habit has now become an extremely dangerous one. Several of the leading railroads are beginning to use a new kind of brake, which, in case of emergency, can be set almost instantly without the presence of the brakeman. Should such an emergency arise while a passenger was steadying himself by one of the wheels, it would, without the least warning, commence to revolve rapidly, and he would lose his hold and run great risk of falling between the cars. This is felt to be so real a danger that the latest patterns for the wheels are made with a web in them, rendering it impossible for the hand completely to encircle the rim of the wheel. This, however, but slightly obviates the danger. A careful man will shun them entirely.—*J. W. Sprague.*

ENDER'S SELF-CLOSING INKSTAND.—The inventor of this neat and simple closing for inkstands informs us that the drawing which he sent us for our cut should have shown a shoulder in the cone, so that it would be pressed open by the sides of the pen without allowing the point to come in contact with the metal. This is, of course, an essential point in the value of the invention.

A COLUMN OF VARIETIES.

Burning fluid is a mixture of alcohol and camphene in the proportion of about four gallons of alcohol to one of camphene. Camphene is simply spirits of turpentine re-distilled.....The Rhode Island Society for the Encouragement of Domestic Industry have just received from Capt. Harris an old English cross-gun, which has the name of the maker, "Richardson," "Manchester," on one of the sights. It was made to carry a ball instead of an arrow, and the bow is of steel.....In the best turbine wheels, the buckets are made of brass and very smoothly polished.....The case of the Irish bruiser, Heenan, who has gone to England from this country to have a fight with a notorious English bully of the name of Sayers, has attracted the attention of the British Parliament, and the question has been asked whether the police would prevent the brutal exhibition.....The Lockhaven (Pa.) *Watchman* records a very remarkable phenomenon, just being perfected in Lockhaven. Some months ago, Mr. John Johnson, of that place, had the middle finger of his right hand amputated close to the lower joint joining the hand. The wound soon healed over, and almost immediately a new finger commenced growing from the stump of the old one, and six months from the time the finger was amputated Mr. Johnson had a new and full grown one in its place, with the exception of the nail, which is just commencing to shoot out.....Dr. Hayes, of Arctic fame, in his recently published work, expresses the opinion, based upon experience, that to men living on a short allowance of food, in a cold climate, where special stimuli are required, there is nothing as valuable as coffee. Tea is not much prized by explorers in frozen regions. To Arctic travelers, the doctor adds, spirits in any form are in almost every case worse than useless, while coffee is always grateful and always beneficial.....In many of the Letters Patent which are brought to us to use in illustrating and describing inventions, it is surprising to see in how bungling a manner many of the specifications are drawn by the inexperienced or incompetent persons who prepared them.....Mitchell's *Steam Shipping Journal* says that the only reason why side wheels are used for steamships is the prejudice of the traveling public in their favor; that all shipbuilders and owners are satisfied of the superiority of screw propellers.....A correspondent of the *Ohio Cultivator*, who is a tile-maker, says that he can make and sell 3-inch sole tiles for 20 cents per rod, and that he can dig, haul, lay the tile and fill up a drain 2 feet 10 inches deep for 6 cents per rod, making the tile drains cost 26 cents per rod. He also says that the owners of mole plows charge 15 cents per rod for making drains 3½ feet deep.....Mr. Gould, of Hudson, N. Y., stated, in one of the New Haven lectures, that there are 3,000 species of grass.....Daniel Webster once said that all over the world, and in all times, the agricultural regions devoted to grazing were more prosperous than grain-growing districts.....The tubes of tubular bridges are painted nearly white, so as to increase the radiation and to diminish the effects of alternations of temperature.....In cases where one blade of a double-bladed screw-propeller has been broken, a fair rate of steaming has been maintained with the remaining blade.....A 2-inch square bar, of the best and most fibrous Lowmoor iron, has been completely crystallized by being hammered by two men for half an hour.....Sea-weed, like all other vegetables, grows most rapidly (out of the tropics) in the spring of the year, and at this time gives most trouble by collecting upon the bottoms of ships.....The fluidity of the Berlin iron, from which the finest and sharpest (although not the strongest) castings are made, is attributed to the presence of arsenic in the iron.....Hard cast iron, when cast in very large masses, and allowed to cool very slowly, is found to become soft. Heavy guns, when cast solid from hard iron, are found to bore easily.....The blue flame, sometimes observed at the tops of the funnels of steam vessels, does not extend down the funnel. It is caused by the combustion of carbonic oxyd, which can only burn by meeting fresh air at the top of the funnel, the mixture igniting at a comparatively low temperature.....Work's *odometers* (illustrated and described on page 300, Vol. XIV. of the *SCIENTIFIC AMERICAN*) are now extensively used among livery stable-keepers in the eastern States, for measuring distances, and in many cases the individuals who go off for a drive of five or ten miles, and take twenty, are brought up "with a round turn" by this contrivance, and often to their great astonishment.