

are 40 feet 8 inches in diameter; and she is provided with Silver's marine governors. Two small donkey engines, two hoisting engines and one steam pump are used on board. The coal bunkers contain 1,800 tons of fuel. A government safety valve is attached to each boiler, and is locked up from the engineers. It is examined at Liverpool by the Surveyor of the Port under the Board of Trade.

The *Scotia* is of unusual strength; her keel plates are  $1\frac{1}{8}$  inches in thickness; the bottom plates are  $\frac{1}{8}$  of an inch; thence up to the load line  $\frac{7}{8}$ -inch plates, and above this  $\frac{3}{4}$ -inch plates. The framing is composed of ponderous bars and angle iron welded and riveted in the most perfect manner. She is divided into seven water-tight compartments, and carries 1,500 tons of merchandise in two water-tight tanks 75 feet by 20 in length and 20 feet in depth. There are 157 state rooms, with sleeping accommodations for 300 cabin passengers. The main saloon is 62 feet in length by 20 feet in breadth, and is 8 feet high. The decorations of the staterooms are tasteful and elegant.

Every thing about this great steamer gives indication that her owners have spared no expense to make her the most perfect passenger steamship ever built.

#### RECENT AMERICAN INVENTIONS.

**Breech-Loading Cannon.**—The principal object of this invention is to obtain a gun in which gun cotton may be used, and which will therefore be particularly serviceable in casemates and between the decks of ships, as the use of gun cotton, owing to the little smoke produced, does not cause the choking thirst, smothering sensation or blindness in the men working the gun in a confined place. Owing to the danger of loading at the muzzle with gun cotton, the breech-loading system is adopted, and the improvements are more particularly directed to the strengthening of the breech and its connections and the surrounding parts, to produce a breech-loading gun of the requisite strength. One improvement consists in fitting the chamber of a breech-loading cannon with a stout tube of steel or other tenacious metal, termed an internal reinforce, the interior of which is much smaller than the caliber of the gun and the length of which is sufficient to enable it to contain the charge. The object of this tube is to strengthen the gun and also reduce the amount of the area of the breech that is exposed to the force of the explosion. Another improvement consists in a novel mode of locking and tightening up the breech, whereby the joint between it and the chamber is made very secure and close. A third improvement consists in a novel priming and firing apparatus. This gun may be used with gunpowder as well as gun cotton. The breech-loading arrangement is very secure and strong. The invention is patented by E. R. McCabe, of Rochester, Iowa.

**Iron Plates for Vessels.**—This invention, patented by Edward Cox, of Covington, Ky., relates both to armor plates applied on the outside of wooden hulls and to iron plates attached directly to the frame of the vessel, the frame being either of timber or iron. It consists in an improved mode of fitting together and combining the marginal portions of the several plates, whereby they are so locked as to hold each other both in a direction lengthwise of the vessel and in a vertical direction, and to assist in holding each other to the sides or frame of the vessel and in strengthening the vessel, and the necessity of using plates of very large size is obviated. A patent has also been taken in England on this invention through the scientific American patent agency.

**Piston Packing.**—This invention consists in the arrangement of spring valves and guides in combination with apertures in the piston head follower, in such a manner that the apertures admit the steam or other fluid from the cylinder into the piston, and are instantaneously closed on reversing the piston, and the steam or other fluid can effectually be employed to produce a tight and reliable packing; it consists further in the arrangement of an additional packing ring on the inside of the ordinary main packing rings of the cylinder, said additional packing ring being provided with a toothed expansion rack and with a spring plate, in such a manner that by the action of the steam or other fluid, the inner packing ring is expanded and the device between the outer or inner packing rings is effectually closed, and by the spring plate the

steam or other fluid is prevented finding its way in between the inner and outer rings. The patentee is P. L. Kreuter, of Bloomington, Ill.

**Machine for Making Candles.**—This machine consists of a horizontal rotating table divided radially to its center into any number of equal sections, each one of which has secured to it a rack for the reception of the molds, and on one side or in front of which is situated a series of spools from which, and through a perforated board, the wick is supplied to the molds when the latter are brought opposite to them by the rotation of the table. The molds are divided vertically and centrally for the reception of the wicks and the removal of the candles, clamps being used to receive the wicks from the spools for their introduction to the molds, and to retain them therebefore and during the pouring in of the tallow or other material. Andrew Black, of New York City, is the patentee.

#### GIFFARD'S INJECTORS.—THE MACHINE BUSINESS IN PHILADELPHIA.

While in Philadelphia for a few hours last week, we made a brief visit to the extensive machinery manufacturing establishment of Messrs. Sellers, and found, to our surprise, that they never were more busily employed in the manufacture of lathes, planers, and all the various machines that are employed for making the parts of engines, and machinery for general manufacturing purposes. We consider this a good indication of the wonderful prosperity and activity of our manufacturing operations amid the conflict now existing in our land. This firm has manufactured about 1,000 Giffard's injectors, about half the number of which were for stationary engines, and the others for locomotives. These ingenious boiler feeders are now employed, to some extent, on almost every railroad in our country.

We noticed a very simple and beautiful arrangement of frictional gearing applied to a new lathe in this establishment. Instead of using a complicated train of toothed wheels to obtain different speeds, any speed required was obtained by the use of three frictional plate wheels, placed one above the other. By moving any of these wheels nearer to or farther from the center of the intermediate wheel, the speed was varied accordingly. The middle wheel is composed of two circular plates, the upper and lower ones of single plates, fitting into the middle plate wheel as into a deep groove.

#### Inventors Relating their Experience.

Persons who are about to secure Letters Patent, and have not decided upon the Agency they will employ to transact their business, are recommended to read the following letters received at this office within a few days. The experience of these inventors may be a guide to others who have Letters Patent to secure:—

MESSRS. MUNN & Co.:—I have just received my patent, and a better-pleased fellow than I am you never saw. The specifications are just what I wanted: I could not have described the machine as well myself. Your work is well done in every respect, for which receive my thanks.  
Yours, truly,  
W. T. ABELL.

Vernon, Iowa, May 25, 1862.

MESSRS. MUNN & Co.:—Yours of the 17th was duly received covering official notice from Washington that my application for a patent has been allowed. Permit me to express to you my sincere thanks for the fidelity and open-hearted manner in which you have conducted yourselves toward me and the efficient manner you have performed my business. I now know there is one Patent Agency in which I can place implicit confidence—a fact I have heretofore believed to be fiction. When I made the application for a patent on my Aerial Machine through your Agency, it was with the determination that it should be the last time I should be swindled by Patent Agents. And when I received the specification for examination and signature I could not but notice the great contrast between the plain simple style in which it was prepared with those I have received from other Agencies. I thought if I was to be deceived again (which I expected), it would be in a new style by which, at least, I should learn something. But imagine my disappointment, therefore, on receiving yesterday's letter, and finding the lesson to be diametrically the opposite from what I had expected. It is impossible for me to express the sincere thanks which I feel for the great kindness which you have shown me. I shall endeavor to show my gratitude by recommending your Agency and paper to inventors. I shall ever feel that I have received a great favor at your hands, and that, too, when least expected. With deepest gratitude, I remain, yours,  
LUTHER CHILD CROWELL.

West Dennis, Mass., May 20, 1862.

MESSRS. MUNN & Co.:—Gentlemen—I received this day the official announcement that my patent for an improvement in Lamp Burners is ordered to issue. Many, many thanks are due to you for the very skillful and thorough manner in which you have performed the complicated and intricate duties of your profession, and the railroad speed

with which you transact your business with the Patent Office. I shall take great pleasure in recommending your Office to all persons who have business with the Patent Office. You also obtained a patent for me in 1859, after it had been twice rejected, and I consider it as valid a claim as could be asked for. These circumstances are sufficient to make me feel grateful toward you, and to incline me to recommend both your Agency and your invaluable paper. Yours, truly,  
SAMUEL MARSHALL.  
Wilmington, Del., Fifth month 27, 1862.

MESSRS. MUNN & Co.:—Your letter announcing that my application for a patent has been allowed, is at hand. I am very thankful to you for the very able manner in which you have managed my application at the Patent Office and for bringing it to a successful issue. When I began making my model it was my intention to employ an Agency in Boston, but on reading in the SCIENTIFIC AMERICAN what you did for inventors I made up my mind that the best thing I could do was to employ you; and I am so well pleased, that if ever I have any more business at the Patent Office, it will be intrusted to your Agency.

Yours, &c.,  
R. T. HATHAWAY.  
New Bedford, Mass., June 2, 1862.

#### Tests of Galvanized Wire Rope.

Several experiments with wire rope were lately made at Liverpool, England, for the purpose of practically ascertaining the value of wire for standing rigging. The first was a piece of 2-inch galvanized charcoal wire, the Admiralty test for which is 4 tons 6 cwt.; it broke at 5 tons 15 cwt. This piece was taken from the 'topgallant backstays of the ship *Bogota*, and was supplied to this ship four and half years ago. It is still in good condition, there being no signs of rust in it, and it stood upward of 30 per cent above the admiralty test. The next test was a piece of 1½-inch galvanized wire rope, which broke at 2 tons 12 cwt. 2 qrs., the Admiralty test being 2 tons 5 cwt. One piece 3¼-inch wire rope, six-strands, stood 17 tons 15 cwt.; one piece 3¼-inch galvanized wire rope, four-strand formed rope, made of fine wire, stood the strain of 12 tons 5 cwt. It was found that the rope composed of the greatest number of strands or wires stretched the least. Galvanized wire rope, for rigging, is now coming into common use.

#### Improvement in Iron-Built and Iron-Clad Vessels.

Wm. Ballard, of New York city, has recently made an improvement in iron-built and iron-clad vessels, which is considered to have some valuable features, and for which a patent has been ordered to issue. Part of the invention is applicable advantageously to mercantile as well as naval vessels. The issue of the patent is temporarily suspended, for the purpose of secrecy, but when the patent issues we will publish a description of it.

**TO OBTAIN THE GENUINE FLAVOR OF COFFEE.**—The aroma which resides in the essential oil of the coffee-berry is gradually dissipated after roasting, and of course, still more so after being ground. In order to enjoy the full flavor in perfection, the berry should pass at once from the roasting pan to the mill, and thence to the coffee pot; and again, after being made should be mixed, when almost at boiling heat, with the hot milk. It must be very bad coffee, indeed, which these precautions being followed, will not afford an agreeable and exhilarating drink.

**WASHINGTON SAFE.**—We think we can assure the Hon. Secretary of War that Washington is safe from any attack of the rebels. The only danger is that Congress, if it continues in session much longer, may possibly explode. If the President could quietly shut up that great public gas manufactory, we think the political atmosphere would be less noisome.

**MARSH GAS.**—M. Boussingault, as stated in *Comptes Rendus*, has discovered that under the influence of direct sunlight the leaves of aquatic plants give off a notable proportion of carbonic oxide and carbureted hydrogen. He thinks that this emanation of carbonic oxide may be one of the causes of the unhealthiness of marshy districts.

**INSTEAD OF THE USE OF THE LANCET FOR THE SUPPRESSION OF BOILS AT AN EARLY STAGE,** Dr. Spooner, of Boston, recommends an ethereal solution of iodine (20 grains of iodine to one ounce of ether), applied with a brush morning and evening. The same application gives relief in chilblains and in erysipelas, or it may be varied by a solution of nitrate of silver.

**A GERMAN WOMAN AT WINSTED, CONNECTICUT,** thinks "we in this country don't know anything about war yet." During the existence of a war in Germany, she was compelled to work in a blacksmith's shop for three years, so scarce were men.

**Punch's Chronology of Future Inventions in Fire-arms**

1860.—Mr. Armstrong, of Newcastle upon-Tyne, invents rifled ordnance, that will knock any ship to pieces. He is knighted, and the Admiralty is *benighted*.

1861.—The Admiralty recovers, and invents iron ships that resist any known cannon balls.

1862.—Sir William Armstrong invents a gun that smashes the iron ships into *blacksmithereens*. The Admiralty collapses.

1863.—The Admiralty re-expands and invents platina ships, fastened with diamond cement, and Sir William Armstrong's balls fly to pieces like bon-bons. Mr. Gladstone doubles the income tax.

1864.—Sir William Armstrong invents brazen thunderbolts (supposed to be the original Jupiter's), and in a pleasing experiment sends the greater part of the British fleet to the bottom of the sea.

1865.—The Admiralty invents torpedo vessels which sail under water, and below any range of guns. Sir William Armstrong tears his hair and swears in the Newcastle dialect.

1866.—Sir William Armstrong invents a vertical gun that discharges Greek fire straight down, and a second time he destroys the greater part of the British fleet. The lords of the Admiralty are about to hang themselves, when a thought strikes them and they don't. Mr. Gladstone again doubles the income tax.

1867.—Dr. Cumming, who has for some weeks been having his coals by the sack only, suddenly proclaims the Millennium. As there is now to be peace everywhere, the Admiralty does not invent anything, but waits to see. In order to test Dr. Cumming's veracity, and to find out whether lions will lie down with kids, the zoological society (against the advice of their excellent Secretary, Mr. Selater), let loose their biggest lion while a charity school is in the gardens. As the lion, instead of lying down with a kid, only lies down to digest him, the Admiralty thinks there is a mistake somewhere, and determines to invent a new fleet. Mr. Gladstone once more doubles the income tax.

1868.—The Admiralty invents a stone fleet, with cork keels, and defies Sir William Armstrong.

1869.—Sir William Armstrong invents the Hannibal shell, which contains the strongest vinegar, and melts the stone ships. Having for the third time destroyed the British fleet, he is raised to the peerage as Lord Bomb.

1870.—The Admiralty invents an aerial fleet, which sails in the clouds, out of shot range, and the first Lord takes a double sight at Sir William Armstrong. Mr. Gladstone a fourth time doubles the income tax.

1871.—Lord Bomb invents a balloon battering-train, and in an experimental discharge brings down all the British fleet into the German Ocean.

1872.—The Admiralty, in desperation, invents a subterranean fleet, which is to be conveyed by tunnels to all the colonies, but Mr. Gladstone blandly suggests that, as everybody now pays twice his income in taxes, the people may object to further imposts, unless some proof of economy is given. Government, therefore, stops the pensions of 100 superannuated clerks, discharges some extra night porters at the Treasury, and brings in estimates for the subterranean fleet.

1873.—Lord Bomb invents his typhæsons, or earthquake shells, and suffocates the British fleet in the Tasmania Tunnel. Mr. Gladstone a fifth time doubles the income tax.

1874.—The Emperor of the French proclaims the Millennium, which of course, immediately occurs; no more war-ships are wanted, and the collectors remit the quarter's income tax not yet due. Lord Bomb invents his volcanic fireworks in honor of the occasion, and by some accident burns up the public.

**An Invention of the Queen of France.**

[From the London Herald.]

The French Empress despises everything common, and the hooped skirt having become so generally used, she instructed her tirewoman to get up something that every woman could not afford. The following is a description of the result of her endeavors:

This wonderful petticoat is in most instances to be made of cambric muslin, so that washerwomen cannot stiffen it too much. Its circumference is six yards at the widest point, and it is covered by nine flounces of still greater circumference. The lowest of these

flounces is a mere frill; the second, a few inches longer and considerably wider, completely covers the first; the third does the same to the second, and so on till one great flounce falls completely over the other eight, each one of which, to arrive at the standard of Imperial elegance, must be hemstitched like a lady's pocket handkerchief, and the outer one in addition be nearly covered with the embroidery done by women of the Vosges. This invention also sets its face against the sewing machine, as nearly every part of it must be handwork. It was purposely so designed to prevent an immense number of seamstresses being suddenly thrown out of employment by the increased demand for machine sewing, which is not yet capable of effecting hemstitching or embroidery.

**How to Make a Domestic Fish Pond.**

A correspondent of the *Homesead* (Hartford, Conn.) gives the following account of making a fishpond:—

Three years ago I constructed in a ravine a fishpond, covering a surface of about three-fourths of an acre. It is fed by four small springs, and receives a large amount of surface water from the slopes around. It is fifteen feet deep at the greatest depth, and has shallow bays and inlets, where the small fish may breed and find protection from larger ones. It contains a small island and the shores are embellished with flags (*Iris*), water lilies (*Nymphaea odorata*) and other water plants. It was stocked with yellow bass, Oswego bass, white perch, and every variety of sun fish and minnows, also a dozen gold fish (*Cyprinus auratus*). And now, at the end of three years, it is astonishing to note the vast increase in my scaly family. They have multiplied by hundreds, and grown in size beyond all my calculations. The gold fish number several hundred, some of them over a foot in length, and a few of them are beautifully marked with silvery sides, and red fins, head and tail; others with golden sides and black fins and tail. I had no idea that they would thus sport in colors, but certainly they are very beautiful. The other fish have grown so much, that I intend to commence using them for the table in autumn. I have not fed these fish, except for amusement and to tame them, when a few crumbs of bread are thrown in, from a small bridge connecting the island with the shore, and the fish called up like chickens. The sun fish, gold fish, and smaller fry soon learned to come at my call, and to follow me in great numbers, from one end of the bridge to the other, for their morning or evening meal.

The young bass (the old ones hold back) and the sun-fish dart to the surface for their food, and have a lively scramble for it; the gold-fish pick up what sinks to the bottom. Their habits in this way are very much like a flock of chickens, for some of the smaller fish take their position immediately under my feet, to pick up the small crumbs that fall in breaking the larger ones to throw out. Some persons ring a small bell to bring their fish up, but I prefer calling mine. They do not appear to come from a greater distance than about forty feet to any one spot. I feed them in several places, to note the varieties and their growth. Now, as to the utility of this pond; it furnishes ice for my own use, and three or four of my neighbors who have ice-houses; it also affords an excellent stock of water, and will doubtless hereafter supply my table with fish. A small skiff on its surface gives many a pleasant hour of recreation to the young who are fond of rowing.

The construction of this pond was very simple. The earth was excavated across the ravine four feet deep and five feet wide for a foundation; then stiff clay filled in and well pounded, to prevent leakages at the bottom. The earth from the bottom and sides of the ravine was thrown on the top of this foundation, to raise the embankment to the proper height. A waste weir at one side, paved with flag-stones, and two feet lower than the top of the dam, sufficiently large to carry off the heaviest flow of water in very heavy rains, guarded by a wire screen to prevent the escape of the fish, completed the construction. It is now sodded over, and planted with willows at the foot, and is considered safe. The expense of making such a pond is small, and it adds much to the value of the farm.

SINCE Greenwood was first laid out as a burying place in 1840, 89,867 have been interred within its limits. Think of it; what a large and silent city.

**Nails in Fruit Trees.**

A singular fact, and one worthy to be recorded, is mentioned by Mr. Alexander Duke, of Albemarle. He states that while on a visit to a neighbor, his attention was called to a large peach orchard, every tree of which was totally destroyed by the ravages of the worm, with the exception of three, and these were the most thrifty and flourishing peach trees he ever saw. The only cause of their superiority known to him, was an experiment made in consequence of observing that those parts of worm-eaten timber into which nails had been driven were generally sound. When his trees were about a year old, he drove a ten-penny nail through the body, as near the ground as possible; while the balance of his orchard had gradually failed, and finally yielded entirely to the ravages of the worms, these three trees, selected at random, treated precisely in the same manner with the exception of the nailing, had always been healthy, furnishing him at the very period with the greatest profusion of the most luscious fruit. It is supposed that the salt of iron afforded by the nails is offensive to the worm, while it is harmless, perhaps beneficial, to the tree.

A chemical writer on the subject says: "The oxidation or rusting of the iron by the sap, evolves ammonia, which, as the sap, rises, will of course impregnate every particle of foliage, and prove too severe a dose for the delicate palate of intruding insects." The writer recommends driving half a dozen nails into the trunk. Several experiments of the kind have resulted successfully.

**Manufacture of Carpets.**

Within a comparatively few years past, several improved kinds of carpet fabrics have been manufactured and come into extensive use. Among these is the well-known tapestry, which has been brought to great perfection. The peculiarity of this fabric is the unlimited number of shades or colors that can be introduced, so that the most elaborately colored designs, with flowers and scrolls, can be executed. The saving of worsted is also very important in an economical point of view. The appearance is the same or similar to Brussels carpet, but the manufacture is more simple, each thread being colored separately at spaces, with the various shades as they follow each other in the design. The process by which this is accomplished is beautifully simple and ingenious, but requires much care in placing and arranging the threads, and putting them on the beam, or the work will be imperfect. The patent Axminster is another kind—the design of this manufacture being to give the beautiful appearance of Axminster or Tournay, at less cost; it has been very successfully and extensively applied to the manufacture of rugs, as well as carpets. Another description of carpets, having the same appearance of Brussels, or tapestry, is also now much in use; this kind is woven plain by steam power, and is afterward printed by the same agency.

**Plant an Apple Orchard.**

When apples are \$3 a barrel and upward, there is not adequate supply in the country. They can be grown at a dollar a barrel, with profit. The apple crop in a single small county in the State of New York, was worth half a million of dollars last year. Other counties in the Eastern States were under the necessity of paying out \$100,000 for this fruit, because they had not the article at home. Peaches and plums we may be able to get along without, but apples we must have—for the dessert, and for the dinner basket of little boys and girls who can not come home from school to dine, and for many other uses. We say, then, to every farmer, plant an orchard of at least a hundred trees. The trees are all ready for you in the nursery, well grown and grafted, two or three years from the bud. Get thrifty trees, of varieties that you know will flourish in your locality, and in four years you will be eating fruit from them. Do not fail to plant an apple orchard this very month.—*American Agriculturist*.

HOUSES IN THE UNITED STATES.—There is one house to every six persons in the country. In New York city there are thirteen persons to a dwelling on the average; in Boston about nine; in New Orleans nearly seven.