Inventor of the Famous Jacquard Loom.

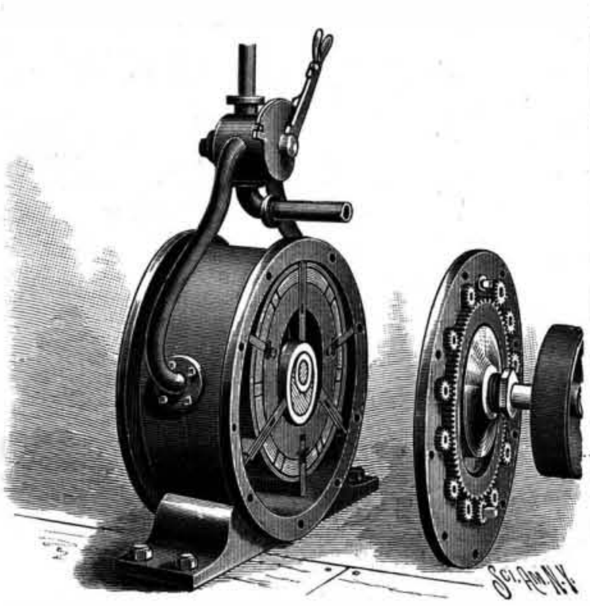
"After seven years—a long time to patiently develop an idea—Jacquard had produced a loom which would decrease the number of workmen at each machine by one person. . . . In gratitude for this discovery he went to the image of the Virgin, which stood on a high hill, and for nine days ascended daily the steps of the sacred place. Then he returned to his work, and seating himself before a Vaucanson loom, which contained the germ of his own, he consecrated himself anew to the perfecting of his invention. . . . It remained for Jacquard to make the Vaucanson loom of the utmost practical use to Lyons and to the world. After a time he was not only able to dispense with one workman at each loom, but he made machinery do the work of three men and two women at each frame. . . . When brought before Bonaparte and Carnot, the Minister of the Interior, the latter asked, 'Is it you, then, who pretend to do a thing which is impossible for man—to make a knot upon a tight thread?' Jacquard answered the brusque inquiry by setting up a machine, and letting the incredulous minister see for himself. The Emperor made Jacquard welcome to the Conservatoire des Arts et Metiers, where he could study books and machines to his heart's content, and gave him a pension. . . . Soon, however, the tide of praise turned. Whole families found themselves forced into the street, for lack of work, as the looms were doing what their hands had done. Bands of unemployed men were shouting, 'Behold the traitor!' . . . The authorities seemed unable to quell the storm, and by their orders the new loom was broken in pieces on the public square. 'The iron,' says Jacquard, 'was sold as old iron; the wood, for fuel.' . . . Soon Switzerland, Germany, Italy and America were using the Jacquard looms, largely increasing the manufacture and sale of silk, and therefore the number of laborers. The poor men of Lyons awoke to the sad fact that by breaking up Jacquard's machines they had put the work of silk weaving into other hands all over the world; and idleness was proving their ruin. . . . The inventor refused to take out a patent for himself, nor would he accept any offers made him by foreigners, because he thought all his services belonged to France. . . . The struggling, self-sacrificing man, who might have been immensely rich as well as famous, was an untold blessing to labor and to the world."—Extracts from the Life of Jacquard, by Sarah K. Bolton.

THE TOXOPHILITE SOCIETY.

The elegant and once fashionable art of shooting with the long bow has been properly called "archery," and everybody knows the meaning of that word. "Toxophilite," however, derived from the Greek, cannot signify anything but the love of the bow; perhaps many people would naturally think it might be the designation of some chemical compound. But if they were admitted to the beautiful grounds of a highly select society, in the inner circle of Regent's Park, they would soon be enlightened, and would learn to admire a graceful kind of skill, not, indeed, so robust an exercise as lawn tennis, yet sufficiently amusing for leisure hours of a summer day.—Illustrated London News.

AN IMPROVED MOTOR OR PUMP.

A motor designed to be worked advantageously by either steam or water, and which may also be readily converted into a powerful pump, is shown in the accompanying illustration, and has been patented by



BROWN'S MOTOR OR PUMP.

Mr. C. E. Brown, of Stayton, Oregon. It has a single cylinder in which turns a shaft from which power is taken, or to which power is applied when used as a pump, the shaft turning in a stuffing box in one of the cylinder heads, and the inner end of the shaft being mounted in a socket stuffing box in the other head. The shaft is placed above the center of the cylinder, so that a chamber for steam or water is formed around the lower portion of the piston, the latter being provided with radial slots in which are sliding supports carrying wings forced outward by springs, and forming abutments against which the steam or water strikes. In recesses in the piston ends are rings, which, as the piston revolves, force the wings inward and outward, and there are also provided short spring-pressed wings, extending only partially across the steam or water chamber, to form an increased area for the steam and water to act against, and also to prevent back pressure. In the ends of the piston, and near its outer periphery, are packing rings made up of segmental sections, pressed outward by springs, a wedge-shaped spring-pressed block between each pair of sections spreading the sections endwise and keeping the rings tight.

The cylinder head nearest the pulley has means of adjustment to take up wear and leakage, having an inwardly projecting portion provided with a split calking ring expanded by a screw which projects through the head, thus making a tight joint. The ring is pushed inward by screws mounted circumferentially on the head, pinions on the outer ends of the screws meshing with a cogwheel engaged by a pinion on which is a stud to receive a crank, by turning which the several pinions are simultaneously revolved to force inwardly all portions of the inner head and calking ring. From a valve casing at the top a pipe leads to each side of the cylinder, either pipe being used as a supply or exhaust pipe, according to the direction in which the piston is to be rotated, and these pipes connect with grooves or ports in the inner sides of the cylinder. A self-governor is also provided for the device when used as a motor, consisting of check valves which open under pressure from within the cylinder, and when the engine is running at high speed the centrifugal force throws out the blades of the wings against the tension of springs, in one form of the improvement, to shut off the supply of steam from the space where the most effective pressure would be exerted.

Meat Eating and Temper.

Mrs. Ernest Hart, who accompanied her husband in his recent trip around the world, appears to come to the conclusion that meat eating is bad for the temper. In the Hospital she says that in no country is home rendered so unhappy and life made so miserable by the ill-temper of those who are obliged to live together as in England. If we compare domestic life and manners in England with those of other countries where meat does not form such an integral article of diet, a notable improvement will be remarked. In less meat-eating France, urbanity is the rule of the home; in fish and rice-eating Japan, harsh words are unknown, and an exquisite politeness to one another prevails even among the children who play together in the streets. In Japan I never heard rude, angry words spoken by any but Englishmen. I am strongly of opinion that the ill-temper of the English is caused in a great measure by a too abundant meat dietary, combined with a sedentary life. The half-oxidized products of albumen circulating in the blood produce both mental and moral disturbances. The healthful thing to do is to lead an active and unselfish life, on a moderate diet, sufficient to maintain strength and not increase weight.

SOUTH AMERICAN ants have been known to construct a tunnel three miles in length, a labor for them proportionate to that which would be required for men to tunnel under the Atlantic from New York to London.

MEETING OF THE TOXOPHILITE SOCIETY.

A Whaling Adventure.

A most disastrous accident occurred to the whaleship Essex, belonging to Nantucket, and commanded by Captain Ronald Pollard. While cruising in the South Pacific the ship discovered a school of large sperm whales, and all the boats were at once lowered to assail them. The mate and captain succeeded in fastening at about the same time. The former lanced his victim, and while engaged in tying his fins together preparatory to securing him alongside the ship, which was about a mile away, but bearing down in response to the mate's signal, the captain was placed in danger by the whale which he had struck making for his boat after rising. Great dexterity on the part of the rowers and steerer swept the boat out of the path of the infuriated fish—which kept on in a direct line, dragging the whaleboat after him with such velocity that the parted waters stood a foot above the gunwale, but were prevented from falling into the boat owing to the great speed maintained. It was quickly seen that the ship was in the path of the fleeing whale, and the captain halloed to the men on board to alter the course of the vessel, and it was evident that the danger was appreciated by the helmsman of the Essex, for the head of the ship was observed to fall off; but ere she could be swept out of the track the whale struck her with such frightful force that the bows were crushed in, and all three masts were carried away. The vessel immediately filled with water but remained floating, with her upper deck even with the water, owing to the number of empty barrels in her 'tween decks.

Fortunately quite a quantity of provisions were in the galley when the accident took place, and a barrel of salt pork and one of beef were recovered from the hold a day or two later. For over a week the crew lived on the deck of the ship, hoping to sight a sail; but none appearing, and realizing that they were in an unfrequented part of the Pacific, they took to the boats, with the idea of reaching Valparaiso, the nearest port. A few days following they sighted Ducie's Island, an almost barren land situated in the latitude of 24° 40′ south and the longitude of 124° 48′ west. In a cave close to the beach the men found eight skeletons, and a board in which had been cut with a sailor's knife the words, "Ship Elizabeth of London." Three of the crew, however, preferred remaining on this sterile island rather than venture three thousand miles in an open boat; so leaving them a small stock of provisions and some fishing lines, the remainder of the men headed to the eastward.

For several days the boats kept together ; then they became separated, never to meet again. Six weeks later a battered whaleboat drifted into the harbor of Valparaiso just as the sun was sinking across the wide reach of crimson-tinted waters. The glory of the sunset bathed the stained and tattered sail until it looked to be woven in threads of gold. Even the gaunt faces of the crew, caressed by tender touches of the mystic glow, became fair to look upon, and their ragged vestments seemed to wrap them about with the raiment of a king.

Upon learning the story of the shipwreck, an American man-of-war, then at anchor in the harbor, was dispatched to Ducie's Island, where the three men were rescued.—Harper's Young People.

The Decline in Price of Electrical Equipments.

In commenting on the business situation and the decline in prices of electrical apparatus, the Electrical Review says : "Six years ago the price for a complete equipment for a trolley car, including two motors, was about $4,500. This price held for a year and a half and then dropped to $3,850, $3,500 and $3,300, until two years ago it was about $2,850. One year ago $2,000 was the price of the same equipment, greatly improved in quality and efficiency, while to-day the average price is between $1,000 and $1,200. We have been told of an electric railway manager who desired quite recently to purchase an equipment for a single car. He wrote to seven manufacturing companies, and immediately was called upon by seven salesmen, all of whom had paid traveling expenses to try for the order. The prices quoted ranged from $1,500 to $640. The manager bought the $640 apparatus. Here we have a decrease in actual selling prices from $4,500 in 1888 to $640 in 1894, a period of six years. In 1888 there were seven electric railways in the United States. In January, 1890, there were 162 electric railways in operation and in process of construction. In January, 1891, this number had grown to 281, while to-day there are probably over 500 cities in the United States equipped with electric roads, many of them of great mileage, as in Boston, Brooklyn, St. Paul, Minneapolis and Cincinnati.

"This marked reduction in the price of railway apparatus during the short period of six years is due largely to competition between manufacturing companies, but chiefly to a reduction in the cost of manufacture, accompanied by an increase in the quality of the product. The margin of profit on the equipment mentioned at $4,500, in 1888, was not as large as it was on a better equipment at $2,850, in 1892, owing to the reduction in the cost of the manufacture. While prices have been fearfully cut during the last year by all the manufacturing companies, partly due to intense competition and partly to the business depression, we do not believe that any company can make and sell a satisfactory car equipment for $640 and clear a profit on it."

Commodore Barron's Prow Ship.*

A model of Commodore James Barron's prow ship was exhibited in the rotunda of the Capitol at Washington in 1836, and is now preserved in the Seamanship building at the Naval Academy, Annapolis, Maryland. Its inventor thus described this, the first steam ram ever proposed, under date February 11, 1836 :

"I would propose that a vessel be constructed of solid logs of light timber, the gravity of which would not exceed four-tenths that of water, and be of such bulk that the upper part of the solid log work of the center vessel would float six or eight feet above its surface.

"Let this vessel, or combination of vessels, be of large dimensions, say from one hundred and fifty to two hundred or two hundred and thirty feet long, and seventy or eighty feet wide, and resembling in their form a steamboat of the treble construction. The prow should be very strong, and for a few feet aft a little sharp; but not so much so as to impair its strength. The point of it should not be reduced to a less thickness than three or four feet, and not exceeding in its whole length beyond the bow of the center vessel fifteen or twenty feet, and that prominence covered with iron plates from three to four inches thick, eight or ten inches wide, and six or eight feet long on each arm, formed into an acute angle to fit the shape of the prow, and enlarged at their junction on the point of the prow to about eight or ten inches in thickness, and rounding outward in sharp pointed knobs, cut in large diamond form. These plates should be placed four or five inches apart from each other and let half their thickness into the wood, which will produce a saw-shaped space upon the prow, and prevent the glancing of the vessel from her object, either up or down or sideways.

"The logs that form the prow should be at least two feet square, thirty or forty feet long, and of the hardest and toughest wood, such as oak or elm, and occupy a space of ten or twelve feet up and down, and be supported on each side by the same kind of timber. The iron plates should be securely bolted through the whole mass, but particularly so through these logs of hard timber. To protect the crew and machinery from shot, let the guard vessels without the center vessel be built twelve or fifteen feet wide, and of solid white pine timber, and projected asufficient distance from the sides of the center vessel to embrace the paddle wheels. These barricade vessels should be of sufficient elevation to cover the upper part of the paddle wheels. Each of the lower parts must form a bottom similar to the center one, and be secured to it forward and aft by the cross logs of which the center vessel is constructed, projecting from her sides to such a distance as to allow spaces for the paddlewheels on each side, and from as many points above the water between the paddle wheels as might be required for strength.

"The water is admitted to these paddle wheels between the bows of these vessels through a channel formed by a long inverted arch, the lowest point of which must descend below the level of the lower part of the wheels. The solid log work, forward and aft of the center vessel, should form a mass of at least twelve or fifteen feet in thickness, or as the side vessels.

"Over the top of these vessels lay a tier of logs about two feet square, which will serve as a protection to the crew and machinery from any assaults by boarding, etc. The middle vessel may be hollowed out, at a proper distance from her extremes, if more buoyancy is required than the timber itself gives, except amidships, and there the log work should be continuous from the prow all the way aft.

"The object of this vessel is to destroy men-of-war by running into them with such impetuosity as to break down their sides sufficiently to admit water in such quantities as would defy all possible efforts to prevent immediate sinking.

"Only about ten or twelve feet of the prow of this vessel ought to be allowed to strike the ship that is assailed; the other parts, above and below, should recede or incline aft, and this ten or twelve feet space should be so situated as to come in contact with the side of the enemy five or six feet above the water and five or six feet below its surface. The resistance to the stroke would be less impeded than it would be were it given by a prow of greater extent, and of course it would be more certain to pierce or break down that part of the side of the enemy's ship which it might come in contact with. Three steam engines of one hundred and twenty horse power each would propel such a vessel at the rate of eight or ten miles, or more, per hour, and should be preferred to larger ones, as they would be less liable to damage from the shock to which they might be exposed when the vessel should come at her full speed in contact with the enemy.

"Let those who are curious or doubtful of the efficiency of this plan calculate the effect which would be produced on a stationary body by a concussion so violent as would be occasioned by a stroke of the prow of this massive vessel. To make it apparent that the strongest ships in the world are entirely inadequate to resist such force, it need only be observed that they seldom come in contact with each other with any violence without sinking or sustaining a most destructive degree of damage.

"Ancient as well as modern history furnishes us with many proofs of the decided effects of this mode of attack. The Romans and Carthaginians were in the practice of running into each other's vessels at their greatest speed, impelled by their oars ; and it is recorded of them that when they found their enemies entangled with their friends, so as to render them stationary for the moment of their assault, that it seldom failed to produce that description of destruction contemplated by the adoption of this invention; but the power of steam and the solid construction of this vessel would give this mode of attack a decided advantage over all other attempts of a similar nature ever heretofore resorted to, and beyond a doubt insure success.

"The proof of the effects of an attack made by a whale on the ship Essex, of New Bedford, in the year 1819, is conclusive that no construction of a ship now known could resist the shock of such a vessel as the one I have described. A circumstance not very dissimilar occurred to Captain Jones, in the United States ship Peacock, in the Pacific Ocean.

"The instances of destruction occasioned to vessels by one running into another are too numerous to admit of a doubt that if the plan recommended above should be adopted on a proper scale, it could never fail of effecting its object.

"The rudder is attached to the center vessel, and must be moved by a wheel which may be placed on the upper surface of the center vessel, under the roof or main covering, either forward or aft; but I should prefer its being aft, and it should be considerably forward and lower down than in ordinary cases.

A breastwork should be raised aft, for the protection of officers and others ; also for the chimneys and steam pipes, in their proper places, which should be circular.

"The timber alluded to in the above description is the white pine—'Pinus strobus'—poplar—'Liriodendron tulipifera'—and some species of the gum, none of which exceed four-tenths of the gravity of water.

"The prow mentioned in the first part of this description is not of such a form as I would either use myself or recommend to those whom I would allow to use my invention; that form might become fixed in the body assailed, but the form represented by the drawing will surely clear itself.

"In speaking of the different presentations of the prow and its momentum, it is to be considered as in contact with a solid body.

"Dimensions, etc., of the steam prow ship :

	"Length. Feet.	Width. Feet.	Depth. Feet.	Number of Cubic Feet.
Middle vessel	150	20	30	90,000
Side vessels .... each	125	12	30	both 90.000

"Number of cubic feet in the three vessels, 180,000.

"Weight of each cubic foot of white pine in the three vessels, 24 pounds.

"Specific gravity of the three vessels 4,320,000 pounds, or 1,963 tons.

"Specific gravity of the three vessels multiplied by their velocity gives as the whole momentum of the three vessels, 43,200.000 pounds.

"Momentum on each foot of the prow, 900,000 pounds."

* Abstract from "Origin and Development of Steam Navigation," by Rear Admiral George H. Preble, U.S.N., in the United Service.

The Camphor Tree.

While camphor was formerly produced in Sumatra, Borneo, and other parts of the East Indies, all now known to the trade comes from Japan and Formosa. The camphor tree is a large evergreen of symmetrical proportions, somewhat resembling a linden. It bears a white flower, which ripens into a red berry. Some of the trees are fifteen feet in diameter and live to a great age. A group of trees in the province of Toosa, about a century old, are estimated to be equivalent to about forty thousand pounds of crude camphor. The camphor is extracted from chips taken from the roots or from the stem near the root, the wood yielding about 5 per cent of camphor, and the root a larger proportion. The annual export of Japan camphor averages about 5,000,000 pounds. The forests in Japan owned by the people are now almost denuded of timber, but the government still possesses large woods of camphor trees, which, it is estimated, will maintain a full average supply of the gum for the next twenty-five years. Plantations of young trees are also making and are well taken care of, and, although camphor has not hitherto been extracted from trees less than seventy or eighty years old, it is expected that under the present intelligent management equally good results may be realized in twenty-five or thirty years. The Japanese Department of Forests, which has the control of these woods, is under good management.