Another 8,000 Ton Steamer.

We recently gave an account of the coming over here of the new steamer City of Rome, and now we have to record the arrival of another great vessel of the same class, the Alaska, of the Guion line, between New York and Liverpool. On this her first passage, as a matter of precaution, steam was only carried at 65 lb., though she is fitted to carry 100 lb. Her best run was 402 miles in a day; but it is believed she will, before long, make 440 miles.

The Alaska is an admirably proportioned vessel. Her gross tonnage is 8,600; tubular length, 526 feet; breadth, 50 feet 6 inches; depth, 40 feet 7 inches to upper deck, 48 feet 7 inches to promenade deck. Her engines are of the compound, inverted, direct acting, cylinder type, the high pressure cylinder being 68 inches in diameter, and the two ton pressure cylinders 100 inches diameter each. The indicated horse power is 11,000, the highest on any steamer in the world. She is built with five decks, the first being the promenade, which runs the full length of the deck, excepting for short breaks aft and forward. For the accommodation of cabin passengers her fittings are most complete, the large saloon being the entire breadth of the vessel and situated amidships. Tables and revolving chairs are provided for 280 passengers, and the upholstery and other furnishings are handsome. Besides the large air ports along the sides of the saloon, there is a stained glass dome overhead, thus furnishing ample light and ventilation at all times. The staterooms are ranged on either side of long passageways, forward and aft of the saloon, each connected with the steward's department by electric bells and furnished with electric lights. The smoking room, ladies' boudoir, social hall, and card rooms are elaborately fitted up. The second cabin is aft, and much attention has been paid to the comfort of second class passengers. The steerage is well and conveniently arranged. The officers' quarters are on the main deck. The vessel is steered by steam, and has steam windlasses and winches for weighing anchors and handling cargo.

She has four masts, the two forward ones being square rigged, and the others schooner rigged. She is built of iron in a series of water-tight compartments, and is provided with the most modern methods for insuring safety and comfort at sea.

Large Photograph.

A photograph, probably the largest ever printed upon a single sheet of paper, is now on exhibition in the art gallery of the American Institute. It is not uncommon to see several views which have been separately printed on small sheets of paper and pasted together to make a panorama of large industrial works, etc., but this remarkable specimen was printed from seven negatives on one sheet of paper, and covers an area of over ten feet in length by about eighteen inches in height. It is a panoramic view of the Centennial grounds in Philadelphia, Pa., and so perfectly are the negatives joined that it is impossible to locate the joints. Were it not for the announcement of the exhibitor that it was printed from seven negatives, no lay observer would imagine that it was other than a single view printed from a single negative.

Duplicates of this picture have been sold at very high prices as sample works of photo art. One was presented to Queen Victoria, and is said to occupy a conspicuous place in the royal gallery. This work is from the gallery of F. Gutekunst, No. 712 Arch Street, Philadelphia.

His exhibit includes other fine specimens. A notable one is a picture five feet long by eighteen inches high, also on a single sheet; and some large views in printer's ink which combine the effect of fine steel engraving with exactness of detail that can only be obtained by the use of the camera. This latter style is especially desirable for views of engineering structures and machinery, which enables the observer to study construction with confidence.

Antidote to the Poison of Serpents.

Very interesting experiments have been made in Brazil, by M. De Lacerda, which have established the fact that permanganate of potash is one of the most energetic antidotes to the venom of snakes. M. De Lacerda has addressed a memorial of his important works to the Academy of Sciences (meeting of the 12th of September, 1881).

The result of these researches is really astonishing: thus, in a series of experiments, frequently renewed, of injecting the active venom of *Lachesis*, diluted with distilled water, in the cellular tissues or the veins of dogs, M. De Lacerda found that the permanganate of potash was able *to stop completely the manifestation of local injuries from the venom.* Yet the same poison, which had served for these experiments, being injected without antidote into other dogs, always produced great local tumefactions, with loss of substance and destruction of tissue.

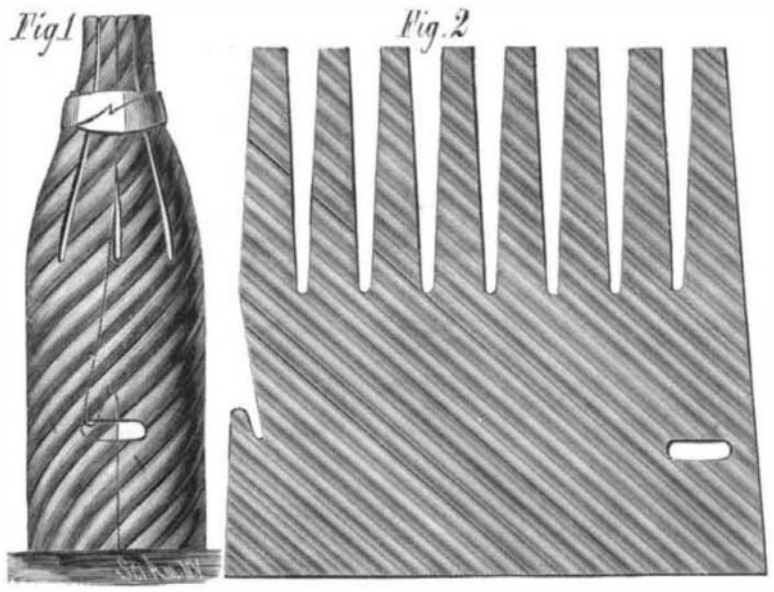
These very remarkable results have been stated on various occasions, not only by the Emperor of Brazil, who assisted at these experiments, but also by physicians, professors of faculties, and members of the diplomatic corps.

NOVEL BOTTLE WRAPPER.

The engraving shows an improved protective bottle wrapper lately patented by Messrs. H. J. Mark and W. F. Martinek, of St. Louis, Mo.

The body of the wrapper is made of veneer or pasteboard, having attached to it thick paper corrugated diagonally. At one edge of the wrapper there is a locking tongue, and near the opposite edge there is a slot for receiving the tongue.

The upper edge of the wrapper is slit to form a series of elastic fingers, which are drawn together about the neck by means of a paper band or tie. Fig. 1 shows the wrapper in its flat state; and Fig. 2 shows the manner of applying it to the bottle.



NEW BOTTLE WRAPPER.

IMPROVED SOLDERING IRON.

The engraving shows a convenient means of adjusting the coppers of soldering irons on their handles, and also for keeping the handles cool.

Fig. 1 is a side view, with handles in an open position. Fig. 2 is a side view of the copper. Fig. 3 is a side view, showing the handles closed and the copper attached. Fig. 4 is a cross section on line *x x* of Fig. 1, and Fig. 5 shows a modified form for wooden handles.

The two portions of the handles are pivoted together to form the jaws, each having a pin or lug on its inner face. The copper is of suitable form, having a cross aperture, into which the pins of the jaws enter when the handle is closed.

IMPROVED SOLDERING IRON.

The shanks of the handle are formed of malleable iron, and their outer ends are enlarged to form a hollow handle. This portion has numerous perforations, which allow circulation of air to keep the handle cool.

On the inner side of the handle are ratchets for engagement when the two parts are closed, to prevent them from slipping apart. With this construction the handles can be removed from the copper while it is being heated, and heating of the handle prevented. The copper may be turned at the desired angle before being clamped tightly by the jaws, and the angle may be readily changed while the tool is in use.

In using wooden handles in place of the hollow bulbs, the inventors provide a ring on the shank, as shown in Fig. 5, which, when slid outward, holds the jaws closed.

This invention was lately patented by James and Thomas H. Hughes, of Spencer, Mass.

MISCELLANEOUS INVENTIONS.

Manufacturers of paper-hangings will find it to their interest to examine the paper-hanging machine and rack recently patented by Mr. Henry Staib, of New York city. In the manufacture of paper-hangings the web of paper as it comes from the printing machine is carried to a rack, where it is suspended to dry in loops on sticks placed at intervals. This invention principally relates to mechanism for taking the paper and carrying it upon the racks, and to the racks used for supporting the paper, whereby the work is facilitated and the operation rendered automatic. In this mechanism rocking arms, which receive their motion from a rotating shaft, first move downward. and, striking a projection on a belt, which has its return movement controlled by a weight, cause said belt to carry the lower stick of a pile of sticks out upon the rocking arms, which are notched to receive the stick. These arms then move upward and deposit the stick, having the paper over it, on rack-bars above in front of pawls attached to slide-bars. A loop of paper is thus carried to and remains suspended from the rack, while the rocking arms move back to receive another stick and loop. The slide-bars then move forward and the pawls carry the stick and loop of paper, after which said bars move back to receive the next stick brought up by the rocking arms, and at the next forward movement both sticks are carried forward. This operation is continued to any desired extent. There is also combined with the slide-bars a roller for automatically marking the web to insure uniformity of the rolls into which the paper is finally made, and a counter for registering the number of loops of paper.

Mr. William T. Lyons, of Decherd, Tenn., has patented an improvement in ice machines which is deserving of notice. The invention consists in a refrigerating apparatus composed of an air-exhausting pump and an air-supply pump separately connected with a series of pipes in a refrigerating chamber for obtaining circulation of air through said pipes by the operation of the pumps, the exhausting one of which is of greater capacity than that which supplies air to the pipes, whereby the air is rarefied, and the atmospheric air drawn in by the smaller pump, in passing through the rarefied air, absorbs more or less heat and reduces the temperature in the refrigerating chamber to the extent required.

An improved life preserver, which appears both simple and practicable, has been patented by Mr. Rosendo Torras, of Brunswick, Ga. This device mainly consists of two parallel cylinders made of any suitable, flexible, waterproof material, supported internally by longitudinally arranged helical springs, and connected externally by gyves, the rings of which encircle the cylinders, and which gyves may be laced with tie ropes. This construction admits of the cylinders being compressed in direction of their length and retained in a small compass, and, when distended, of their forming a pontoon for buoying shipwrecked persons. The extensible cylinders are fitted with flexible receptacles for food and water arranged within the springs and accessible from the exterior by necks projecting through the gyves. There is also combined, with the device, an oar for steering or propelling the raft, and which is constructed so that it may be used to lock the cylinders both in their distended and closed conditions.

An automatic hog-feeder, the object of which is to facilitate the feeding of hogs and prevent waste of the food, has been patented by Mr. Hiram T. Phenix, of Oketo, Kan. This device is formed in part of a box of any desired length and depth, according to the number of hogs to be fed and the quantity of food to be given at a time, and of such a width that two hogs may feed from opposite sides without their heads coming in contact. Said box, which has openings in its opposite sides of a size sufficient for a hog to insert its head only, is divided by longitudinal and transverse partitions into food chambers and feeding compartments having inclined covers and regulating slides, whereby the food is only supplied as it is eaten and the escape of food from the food compartments can be shut off when desired. By means of this feeder the hogs cannot waste the food, and cannot get their feet into it and dirty it.

A very simple and useful fastening for pocket book handles, which provides for the handle being shut up within the pocket book when not required for use, has been patented by Mr. Thomas P. Spencer, of New York city. The invention consists in the combination with the pocket book frame having slots and bars across the slots, of hinged straps connected with the handle, whereby the said handle can be swung down into and inclosed within the said pocket book, the cross bars of the slots forming the hinge pivots of the straps to which the handle is attached.

The Infection of American Cattle on English Ships.

A very instructive report has been submitted to the Department of Agriculture by Dr. Charles P. Lyman, veterinary surgeon, who was sent by the department to England last summer, to investigate the origin of the foot and mouth disease which had appeared in certain shipments of American cattle. The course of the cattle on this side had been carefully traced, and no signs of the disease had been detected along the roads or in the stockyards the cattle had passed over and through.

It appeared certain, therefore, that the disease was caused by infection, communicated to the cattle after they were shipped from American ports. After very careful inquiries, Dr. Lyman discovered that the vessels, portions of whose cargoes of cattle were condemned, had brought to the United States on their outward voyages general cargoes, among which, in many cases, were such articles as "bales of goat skins," "casks of salted skins," "bales of unwashed Australian wool," "bales of Russian wool," "bales of raw skins," "casks of wet skins," "bundles of grain bags," and "bundles of head ropes." In many cases these articles were carried in those portions of the vessel which were occupied by cattle during the return voyage. Dr. Lyman found, however, that upon some of the vessels upon which the disease was found to prevail upon their arrival in England, no such articles had been carried on the outward voyage. The fact that hides, skins, and wool had been carried was not, therefore, sufficient to explain the subsequent outbreak of the foot and mouth disease on apparently uninfected vessels.

Cattle shipped to Great Britain, whether from the United States or from the continent of Europe, are tied to stanchions by ropes passed around their horns, these ropes being technically known as "head ropes." Dr. Lyman found, after careful investigation, that it is a common practice to drive the animals ashore with these "head ropes" still attached to their horns. Sometimes these ropes are detached before the cattle leave the stockyards, but frequently they go with the animal to the butcher. Dr. Lyman also discovered that these "head ropes," gathered from cattle received from France and Germany, as well as from the United States, are often shipped to the United States to be used in tying other animals shipped to Europe.

Following up this clew, Dr. Lyman became convinced that in most cases the infection had been conveyed by the indiscriminate use of head ropes impregnated with the virus of the disease. It was by means of such head ropes, according to Professor Brown, of the British Veterinary Department, that the disease had been introduced into the London yards from France, in September, 1880, and subsequently conveyed to the Liverpool stockyards.

Dr. Lyman proposed, as a preventive of future outbreaks among American cattle in transit, that the department ask Congress to pass a law prohibiting the introduction of all articles from the foreign animal wharves of Great Britain. One would naturally think that the hazard attending the use of old head ropes would be sufficient, now that it is known, to deter our enterprising cattle shippers from using them.

Touching the condition of American cattle on their arrival in England, Dr. Lyman says, that notwithstanding the much greater distance they are necessarily carried, they arrive with fewer bruises and in better condition generally than do those from some of the neighboring European ports. This gratifying condition of affairs is due to the good care and improved methods of ventilation, etc., adopted by the owners of steamships. The losses of cattle on shipboard from January 1, 1880, to September 30, 1880, exceeded five per cent; in the corresponding months of 1881 the losses were about two and one-half per cent.

Torpedo versus Fire.

Torpedoes had been up to a very recent date considered in the exclusive light of their destructive properties—it is gratifying to see that they can also be put to the use of preserving property from fire. On the 10th of August, one of the magnificent steamers belonging to the French Transatlantic Company was at Goletta, discharging. Her name is a well known one, as it reminds us of one of the founders of that company; it was the Isaac Pereire. So late as one o'clock in the morning the work of discharging had been going on under the superintendence of Captain Araud, the commander; he then went a last time round the ship, and retired to rest. At two o'clock he was roused by an alarm from the fore part of the ship. The Isaac Pereire was on fire, and the fire had spread with such a rapidity that the crew had to leave their quarters without saving anything. The steerage passengers, surrounded as they were by the raging element, were saved only owing to the unremitting exertions of the crew and the skillful maneuvering of the commander, who swung his ship, and, placing her before the wind, thus limited the advance of the fire and kept the stern untouched. Meanwhile the purser and doctor were busy protecting the saloon by closing the bulkheads and disposing the hose. The sound of the bell had called the assistance of the men-of-war at anchor in the harbor, and soon twenty-two steam launches and other boats had come to the rescue. Commander Araud wanted to scuttle the forepart of the ship, but the heat was so intense that the men who attempted it, although protected by a continuous and powerful stream of water thrown upon them, had to fall back, not without having been severely scorched. Commander Araud then applied to the officers from the men-of-war for a torpedo, but they at first declined to take such a responsibility upon themselves, a responsibility which the commander did not hesitate to assume. A torpedo was procured, and everybody taken away from the ship, with the exception of Commander Araud, who stood on the bridge. A first torpedo missed fire, a second sent the Isaac Pereire down stem foremost. Her commander, who had not left the bridge, was safely rescued from the water, having only by a miracle escaped being hurt by the explosion. The Isaac Pereire will be easily raised.—*London Review.*

Double-Driving Tricycle.

Considerable activity has of late sprung up in the manufacture of tricycles, which are considered as safer vehicles than the bicycles, especially for those who are not gifted with the natural skill necessary for working the latter. We here give a cut of a new English tricycle by Hillman.

The driving wheels, 50 inches in diameter, run in double ball bearings, affixed to the back of the frame, which is composed of seven-eighths inch steel tubing. A single length of tube bends in hook form at the top above the bearings, being strengthened close to the bearings by a transverse tube, carrying the seat socket. The loop formed by the main portion of the tubing sinks in a hollow curve forward, the sides running parallel and uniting in a bowed front, from the center of which the backbone of the rudder wheel departs. This rudder wheel is 17 inches in diameter, runs in ball bearings, and works in a fork head, with gaping slot, to allow of greater facility in turning. The hook-like ends of the upper part of the frame are used for affixing the handles to an ordinary pear-shaped, purchase handle finding a place on the left-hand side, while the right-hand end of the frame finishes in a socket, in which an upright rod works,

bearing a spade handle at its upper end and a pinion wheel at its base, which, working in a ratchet in connection with the rudder wheel, forms the guiding communication. The pedal shaft is double-cranked, provided with rubber pedals, and works at each end in parallel bearings. The safety of the rider is secured by light rods proceeding backward, and carrying a small safety-wheel at their junction. The spring is placed at right angles to the machine when a seat is supplied, and in a line with the running when a saddle is preferred; it is adjustable to height of rider, and places him well over his work.

The chief feature of the machine, however, is the double driving action. It consists of a stout toothed wheel and box, all in one piece, the outside of this box forming a fine broad surface for the strap brake to work upon. On the inside of the box there are two toothed wheels and two pinion wheels; the former are placed about an inch apart; they are the same size, and are each connected with one of the driving wheels. The pinion wheels are fixed upon studs projecting from the side of the case, and are so arranged that, while each pinion gears with a different toothed wheel, they gear with each other in the space between the main wheels, one pinion projecting forward, the other backward, for the purpose. This arrangement causes both wheels to be driven when running straight, at the same time allowing the outer wheel to travel faster as requisite for turning purposes, and when driving ahead an equal amount of power is imparted to each wheel.

A New Application of the Radiometer.

A new application of the radiometer to photometrical purposes, suggested by M. Coulon, is described in *La Lumière Electrique*. The instrument is really a photometrical balance, and is simple in principle, although some rather complicated arrangements are required to prevent disturbance from surrounding influences. It is generally known that the movement of Crookes' radiometer is now ascribed to the action of radiant heat, although at the time of its discovery the motive power was thought to be light. M. Coulon, however, claims to have proved by experiment that a radiometer of which the temperature is constant, revolves solely under the influence of light. Whether this contention is well founded or not remains to be proved by independent observation. Upon this principle the Coulon photometer is based, and the name *athermanous* which it bears is a further evidence of the importance attached to this rehabilitation of Crookes' supposed discovery of the motive power of light. The apparatus consists of a radiometer bulb, fixed in the middle of a cube-shaped metallic box, having four glazed apertures in its sides. Horizontal rays of light from two opposite sources can enter by two of these openings, while the others allow of observations being made of the bulb. The box is filled with water, which, by means of four vertical pipes surmounting spirit lamps, is maintained at a constant temperature above that of the radiant heat, at this point, of the light-source to be measured and compared. In practice about 100° Fah. is found sufficient. The radiometer bulb contains, *in vacuo* as usual, a disk movable round a vertical axis; the half disk on each side of the axis being black and the other white. Suppose, now, a single source of light to be directed on the bulb from one side, it attracts the white half and repels the black, so that the disk turns edgewise to the light, and presents a side view to the observer in front. If another light of equal brilliancy acts simultaneously on the other side, and at the same distance from the disk as the first, the counteraction of the two lights results in the disk presenting its sides to the direction of the light and its edge to the observer. When unequal lights are to be compared, the disk or one of the lights may be shifted until the relative distances of the two sources determine their intensity in the usual way. It is stated that the apparatus is not patented.

Correspondence.

The Principle of Mutual Accumulation.

To the Editor of the Scientific American:

In the issue of your SUPPLEMENT, date of November 19, appears a special article by Dr. Gustave Glaser. This article contains some historical remarks that I am sure you, with the usual American desire to give every man a fair hearing, will allow me to object to. Dr. Glaser offers therein what he is pleased to think unimpeachable evidence of the prior right of Dr. Werner Siemens to the discovery of the principle of "mutual accumulation" in dynamo-electric machines. But Dr. Glaser is too evidently biased. He does not accord to Sir Charles Wheatstone that preparation of a great discovery that he accords to Dr. Werner Siemens, unwittingly thereby paying Sir Charles the greater compliment, since he acknowledges a difference only of a month in publication. Now, sir, I have had the honor of having been chief assistant to Sir Charles Wheatstone for a considerable period, and the greater honor by hard work to have been placed in close familiarity with so eminent a man of science, who was pleased to show me, many years before this claim of German priority became so pressing, the notes of his experiments on this principle of "mutual accumulation," made several years before publication. Before his death, however, Sir Charles told me that he believed that priority was really due to Hjorth, the Swedish electrician. As Sir Charles Wheatstone has been dead some years, I have, of course, no personal interest other than that due to the memory of an old master, in claiming for him the priority due to him, except it be a new version of the trite saying, "Dead men can tell no tales" (for themselves).

Dr. Glaser says: "But by a comparison of both lectures it is plain to see that Mr. Wheatstone mentions nothing that had not been said six weeks before publicly by Dr. Werner Siemens in Germany." There is, sir, a great deal, which even the Dr. C. William Siemens, of London, is good enough to acknowledge in his paper read before the Royal Society recently on March 4, 1880. PAGET HIGGS.

Self-Acting Car Couplers.

To the Editor of the Scientific American:

In an article from W. S. Huntington, published November 19, on requirements for car couplers, he says: "Any number of cars coming in contact should be coupled automatically; but it should be so arranged that no coupling will be effected unless so desired."

Admitting, for the present, that the first requirement has been filled, does Mr. Huntington believe that it would not be practically easy to fill the second requirements? It is so natural for most draw heads not to couple that a hundred different modes can be suggested to prevent an automatic coupler from working, but with all of them it is necessary for the brakeman to do something; either pull a chain, drop a pin, or move a lever, thus throwing some obstruction in the way of or changing the position of the parts and preventing coupling. But if they are left in that position, the next time the draw heads came together they would not couple, and so would not fill the first requirement until the obstruction was removed and the parts rearranged. So that simply to keep the cars from coupling, it is necessary to make two trips, one to set the obstruction and one to remove it afterwards.

Another of Mr. Huntington's requirements is that the draw heads can be uncoupled from the ground or top of the cars without going between them. If this was complied with would it not be much easier, quicker, and safer to allow the cars to couple and then go there and uncouple them, making only one trip instead of two?

Of course, with an automatic coupler, it is necessary, after uncoupling, that the draw head remain uncoupled until the cars separate; and it is also necessary that the uncoupler adjust itself, so as not to prevent another coupling. These last are practical, but think it will be some time before a draw head is invented that will decide for itself when the brakeman wants it to couple and when not to. F.

AN interesting note from Paget Higgs, the well known author of the work on "Electric Light," and of other volumes, appears in this column. He corrects the statement of a correspondent who gave to Dr. C W. Siemens the priority of the "mutual accumulation" principle.