

A Novel Gunboat.

A boat named the *Staunch*, built for the Admiralty upon the proposition and plans of Mr. Rendel, of the firm of Sir W. Armstrong and Co., has just been tried off the Tyne. A correspondent gives us the following account: "This vessel, though wholly insignificant in appearance and cost, represents some very novel principles. She is only 79 feet long and 25 feet beam; her draft of water when loaded of 6 feet, and her displacement 150 tons. She has twin screws driven by two pairs of condensing engines of 25 horse-power (nominal) combined, giving her a mean speed of 7½ knots. Such being her dimensions and power it is hard to suppose that she can be in the least degree formidable. She carries, however, as heavy a rifled gun as any in the navy, and to all appearance carries it most efficiently. The gun, a 12½ ton 9 inch Armstrong, is mounted in the fore part of the boat in a line with the keel, and fires through a bulwark or screen over the bow, which is cut down and plated something like that of a monitor. Thus placed, it is easily worked in a rolling sea, and its change of position by recoil does not appreciably affect the trim of the vessel. At the same time, to provide for heavy weather, it is made capable of being lowered into the hold, so as to relieve the little vessel of its deck load, and enable it to carry the weight as cargo. Machinery is also employed for the purpose of working the gun, by which means more than half of the ordinary gun's crew can be dispensed with. It is in these mechanical arrangements that much of the interest of this vessel lies. The operation of lifting and lowering is performed by simple but powerful machinery. During the trials the gun, with its carriage and slide, and the platform carrying them—weighing in all 22 tons—was raised and lowered in a rough sea, with the boat rolling 11° each way, in from six to eight minutes. When the gun is lowered the gun well is closed and the deck left perfectly clear, but in a few minutes the gun can be again brought up ready for action. During the trials the 12½-ton gun was easily handled by six men, and fired with extra charges of 56½ lbs. of powder and 285 lbs. shot. It must be observed that very little, if any, training is requisite with the gun of the *Staunch*. The vessel is so small as to be a sort of floating gun carriage. Her twin screws enable her to turn rapidly in her own length. Her helmsman is placed just behind the gun. The gun, therefore, can be laid by rudder right and left with far more ease and speed than any gun of similar weight otherwise mounted. During the recent trials, with the engines driving reverse ways, the vessel made the full circle in her own length in 2½ minutes. With both engines going full ahead she made by the helm a complete circle of seventy-five yards diameter in 2½ minutes. The *Staunch* is wholly unarmored. Her strength and security lie in her great gun and her diminutiveness. And she must be considered as one of a flotilla of similar vessels. Sixty such could be built at the price of a single armor-clad frigate, and ten of them, acting from different points, doubling in their own length, escaping into shallows, sheltering under forts, would drive off or render a good account of any hostile vessel venturing to attack our harbors. Primarily they are intended for harbor defence; but the power of lowering the gun and carrying it as cargo, would afford great security for these vessels at sea, and enable them to be sent from harbor to harbor with safety. The *Staunch* is now to be sent round to Portsmouth, where she is to be attached as experimental gunboat to the gunnery ship *Excellent*."—*Pall Mall Gazette*.

Trial and Loss of a Self-Propelling Vessel.

A San Francisco letter in the *N. Y. World*, says that a Mr. Robinson has from time to time, in the papers, put forward an invention which he claimed was to be almost self-propelling, without the use of steam power. The peculiar features of the new aquatic craft was, that two or three boats hitched together, one behind the other, by the action of the waves the series of boats was to obtain propulsive power. An experimental craft was built at an expense of about \$8,000. Considerable curiosity was felt in the community as to the success or non-success of the new notion, and many went to view the craft during construction. If it succeeded, a revolution was to be worked in navigation. Sails and steam would be superseded. On the ocean and great lakes the rougher the sea the faster the boat would travel.

The inventor was sanguine that his new craft would travel the water by its innate propulsive power, independent of steam or other expensive motor, enjoying the tempest and glorying in the storm. The craft was completed, and the day for the trial trip appointed. So confident was the inventor of success that he took on board stores for a ten day's voyage. At ebb-tide the new (to be) sovereign of the seas put off from the wharf to which she had been fast since her construction had been completed, and started out on her voyage. There were on board four persons: the inventor, Captain Young (a pilot), and two sailors. She was hardly clear of the wharf when she swung around broadside to the tide and commenced a series of movements not very promising of success to the undertaking. She would not obey the helm at all, but lurched continually, in an uncomfortable manner for those on board; first one wheel house would be submerged, then the other. The new craft made excellent time, proceeding end wise like a crab, but the wheels seemed to have no effect whatever on speed or direction. The wheels, depending upon the water they were passing through for motion, would turn any light machinery on board the boat, but would not move the boat ahead an inch. The craft would simply move with the water, not through it. The inventor was still sanguine that, with regular waves, the boat would be an assured success. All he required was regular waves. Once outside among them, things would change; the rougher it became the better. The boat went on like a raft until it got outside the heads, then over

the bar into rough water, and no sooner was it in rough water than the whole contrivance was turned over. The party on board sought the water for safety, and clambered into a boat which had been taken in tow in case of accident. The pilot boat *Caleb Curtis* picked up the unfortunate navigators. The steam tug *Rescue* came alongside the *Curtis*, and offered to tow the refractory craft up to San Francisco for \$500, but Mr. Robinson did not seem disposed to give so much, so the unfortunate craft went on toward the resting sun, keel upward. Mr. Robinson is reduced to poverty by the result of his ill-starred experiment.

Earth Circuit in Telegraphy.

The failure of the earth circuit of a short telegraphic line in the Pewabic copper mine, Lake Superior, is interesting from a practical point of view. The wire used was a one-sixteenth inch copper wire, wound in the same manner as waterproof fuse, the wire taking the place of the powder. To the surprise of all, no signals could be transmitted through the line. The end of the wire underground was put into a hole drilled into the rock and tamped in; a bed of earth was then made, and lastly a pool of water tried, but all to no effect. Above ground the line worked well enough.

Though the earth, generally speaking, will conduct electricity, some substances, of which any specific portion of the earth may be composed, will not conduct it; for example, dry sand and dry freestone rock will not, and quartz rock will not any more than glass; dry earth will not, as is recognized by all telegraph constructors, who bury the earth plates deep in damp earth. In this case an attempt was made to form an earth circuit in non-conducting material. The end of the wire in the mine was tamped into the solid rock, probably quartz, which would be about the same as tamping it into a glass bottle, filled with earth or water. The chances of electric communication would be still less, if the wire was not perfectly insulated in its whole length. The remedy would be to make a return circuit of insulated wire.—*Mechanics' Magazine*.

Mirrors Without Mercury.

The ordinary method of preparing looking glasses is with an amalgam of tin and mercury: four parts of tin to one of mercury.

In the invention, reported by M. Salvetat to the Society of Encouragement, in Paris, neither mercury nor tin is used at all. The tinfoil is replaced by platina, not applied in leaf form, of course, but chemically, in a metallic and brilliant powder. The operation is perfectly simple. The glass, having been carefully cleaned and polished, is covered, by means of a brush, with a mixture of chloride of platina, essence of lavender, and a dissolvent composed of litharge and borate of lead. When dry, the glass is placed in mufflers, when the essence, being volatilized, leaves a deposit of platina dust firmly united to the glass. While two or three weeks are necessary for the manufacture of ordinary mirrors, the new process only requires a few hours.

Insect Fabricators of Iron.

It is well known that some insects are skilful spinners, but it was not known that some of them fabricated iron. A Swedish naturalist, M. de Sjogreen, has published a curious memoir on this subject. The insects in question are almost microscopic; they live beneath certain trees, especially in the province of Smaland, and they spin, like silk worms, a kind of ferruginous cocoons, which constitute the mineral known under the name of "lake ore," and which is composed of from 20 to 60 per cent of oxide of iron mixed with oxide of manganese, 10 per cent of chloric, and some centimeters of phosphoric acid. The deposits of this mineral may be 200 meters long, from 5 to 10 meters wide, and from 8 to 30 inches thick.—*Rev. de Therap. Med. Chirurg.*

MANUFACTURING MINING, AND RAILROAD ITEMS.

A report by the superintendent of the geological survey of India, shows that the British territories cannot be considered as either largely or widely supplied with coal. He ascertained that extensive fields existed, but they were not distributed generally over the districts of the Indian Empire. In the opinion of the superintendent, the very best coal from India only touches the average quality of English coal, and, moreover, the former is not capable of more than two thirds, in most cases not more than one half, the duty of the English coal.

The distance between London and Paris is now traversed daily by the South, Eastern and Northern of France railways, in less than ten hours. Two express trains leave the Paris terminus of the Northern of France system daily for England. More than 200,000 passengers passed over this route in 1867.

Among other sequences of the passage by the State Legislature of the Erie bill, is the prompt finishing of the Albany and Susquehanna railroad, now destined to become virtually a branch of the Erie road, running from Binghamton to Albany. The bill just passed requires the money received from the recent issues of bonds to be expended on the road, and as a consequence of this provision, and the late terrible tragedy caused by a broken iron rail, the entire Delaware division of the road is to be relaid with a double track of steel rails.

The London *Colliery Guardian*, speaking of the presence of phosphorus in the Cleveland iron, which so seriously reduces its market value, and renders it necessary to bring iron from other districts to mix with it in the puddling furnaces—calls for some method of removing this sulphur, showing that if extracted, even in its lowest priced form—as a manurial ingredient—it would be worth at least \$330 per ton. There is, therefore, a tolerable good margin for working expenses, while the iron now worth \$12 per ton, and containing one per cent of phosphorus, would, if freed from this element, be worth at least as much as hematite iron, or say 13.50 per ton.

Engineer Roebing thinks that railroad draw bridges are a nuisance, which can readily be done away with. He would substitute high bridges, even with steep approaches, a stationary engine and a wire rope being provided to assist the trains over the rise. In other words, treat the bridge like an inclined plane, and draws will be unnecessary.

A new railroad project is exciting the wide-awake capitalists of Pittsburgh, Pa. It is proposed to build a road from Pittsburgh to Newbern, N. C., along the Monongahela river to its source in West Virginia; thence by Greenbrier Mountain and river to the junction of the latter with New River, and thence to Newbern. The road would penetrate a rich mineral region, and would bring large quantities of iron ore to Pittsburgh.

The Metallic Cartridge Company, of East Bridgeport, Conn., have a contract from the government of Brazil for 6,000,000 cartridges. They have now supplied two thirds of the order, and after shipping the remainder the company will immediately begin the manufacture of 7,500,000 for the Russian government. The daily product of the works at present is 150,000 to 170,000 cartridges.

The Allentown Rolling Mill is one of the largest establishments of the kind in Pennsylvania. It is for the production of railroad iron exclusively, and turns out four hundred tons of rails per week. The daily work is two hundred and sixty-six rails, thirty feet long and weighing fifty-six pounds to the yard, or five hundred and sixty pounds each.

The rails of the Union Pacific railroad are now being laid on the descending slope of the Rocky Mountains, the summit of the Black Hills, the highest point of the system being crossed on the 16th ult. According to Blickensdorff's survey, the railroad crosses the mountains at this point at an elevation of 8,243 feet, being, as we have before had occasion to state, the highest point reached by any railroad in the world.

Professor Chapman, of Toronto, writes that he has discovered gold on Lake Superior, the metal existing in certain specimens of galena and copper pyrites, occurring together in well defined veins in the region of Black Bay. Surface specimens entirely destitute of "free" or visible gold, show a value of nearly \$21 per ton, irrespective of the large amount of lead and copper present in the ore. The rocks are identical, in general age, with the gold bearing rocks of Nova Scotia.

All the conductors on the New York and New Haven railroad have made their appearance in new uniforms, furnished by the company. The largest part of the road lying in Connecticut, the law of this State, requiring railway officials to be thus distinguished, does not affect this company, and hence their action in this matter is the more to be commended. In this connection we note that our Legislature has empowered railroad conductors with the authority of special policemen, the better to preserve order on the railway trains. We hope they will use their authority by arresting some of the numerous pickpockets who infest the trains out of New York.

The Mount Washington Railway, in the White Mountains, was completed last fall one mile and thirty rods of the three miles up the mountain. For the next mile the tracks are covered with snow two feet deep. The number of hands will be increased in three weeks from fourteen to fifty. The present estimate of the cost is \$100,000, though the figures may add differently at the completion of the work on the 1st of September. The road is built on what is known as the "Marsh" plan, illustrated in Vol. X., No. 10.

Recent American and Foreign Patents.

Under this heading the usual weekly notes of some of the most important recent American and foreign patents.

MACHINE FOR MEASURING CLOTH.—George R. McIntire, Houghton, Mich. In this invention the cloth is placed between two rollers, which are rotated by its motion, and the revolutions of which are recorded by a registering apparatus.

WATER WHEEL BUCKET.—Jacob Clark, Clarksville, Pa.—In this invention the bucket has two curves, one of which receives the direct impulse of the water as it enters the bucket, the other receiving an indirect or "reacting" impulse, as the water leaves the bucket.

SHINGLE MACHINE.—Smith Head, Halifax, Pa.—This invention has two carriages and two sets of saws, and cuts a shingle at each forward or backward motion of either carriage. It has a new apparatus for adjusting the bolts to the saws, and a new edging apparatus.

CORN PLOW, PLANTER, AND CULTIVATOR.—Isaiah B. Arthur, Sidonsburgh, Pa.—This invention combines a new arrangement of the plow's cultivator guards, and covering roller, with a new and greatly simplified method of operating the seed distributor.

CRYSTAL FOUNTAIN.—J. C. Johnson, Louisville, Ky.—In this invention the water is mingled with air in the apparatus, and is found in the form of beads or spray from the fountain, forming a beautiful jet for scenic and ornamental purposes.

SAFETY TRUCK.—S. Y. Bradstreet, Monticello, Iowa.—This invention has for its object the prevention of railroad cars from bouncing off of the track, and consists in the employment of an auxiliary truck of peculiar construction, which guides the main trucks, and which cannot by any ordinary obstructions be thrown off of the rails.

NAILS.—F. Davidson, Richmond, Va.—This invention relates to a machine for making cut nails, and it consists in a peculiar construction and arrangement of parts, whereby a very simple and efficient machine for the purpose is obtained.

LOCK.—H. H. Ewell, South Norwalk, Conn.—This invention relates to a lock of that class which are provided with a reversible slide catch so arranged that it may be adjusted to suit either a right or left hand door—that is to say, be capable of being applied to a door which swings in either direction. The object of the invention is to obtain a lock of the kind specified, which will be simple in construction, and which will not be liable to get out of repair, and require but a simple manipulation to adjust the slide catch as circumstances may require in applying the lock to the door.

SAWING MACHINE.—Thomas Jenkyn, Thetford Centre, Vt.—This invention consists in a novel arrangement of circular saws and rotary cutters, in connection with frames and tables, whereby a machine is capable of performing various kinds of work, such as slitting boards, planks, or other stuff, cross-cut sawing, the cutting of shoulders or tenons, grooving or beading, and chamfering or cornering.

CLOTHES WRINGER.—M. Pierce, Winona, Minn.—This invention relates to a simple arrangement of parts, which is a great improvement on ordinary designs.

CAR BRAKE.—L. J. Smith, Hamilton, Ohio, and D. S. Knight, New York city.—This invention relates to a combined railroad car brake and starter, the device being so arranged that when the brake is applied the starter will be wound up, so that when the brake is again released the cars to which the device is applied will receive a start, thus overcoming the inertia of the car, whether the same is at rest or in motion.

MACHINE FOR BENDING RINGS.—Wm. H. Peckham, New York city.—This invention relates to a machine for bending metal bars into perfect and correct rings, of any suitable diameter, and it is particularly intended for jeweller's use, to form finger rings, bracelets, and other suitable articles, and may, if desired, be used with equal advantage for shrinking tires and other large and heavy rings.

LARD PRESS.—Solomon S. Avis, Pens Grove, N. J.—The object of this invention is to furnish a cheap, simple, and effective lard press for household use.

FLUID METER.—Charles E. Moore, Elizabethport, N. J.—This invention consists of a measuring cup affixed to a lever beam, properly weighted, by means of which the quantity of spirits filling the cup is both weighted and measured. The cup being filled is decanted automatically by its own weight, at which instant the spent pipe is cleansed by a proper mechanism, and the supply cut off until the cup returns to its first position, when the spirit is again permitted to flow. The trimmings of the lever are connected with suitable registering mechanism, and the whole apparatus contained in a locked case of sheet metal, having a dial plate in front for the registering pointers.

GATHERING TURPENTINE.—A. Pudigon, Charleston, S. C.—This invention relates more particularly to the gathering of crude turpentine from the pine tree, but may be employed for the collection of all resinous gums of a kind dried character, which exude from wounds in trees.

MAKING ROOFING.—James H. Cole, Adrian, Mich.—This invention is designed as an improvement upon the device recently patented by Edmund Richardson and James H. Cole, for a process for making roofing and machines for the same, and consists in supporting the rolling instrument employed in said process, by an arm which reaches to and travels upon ways overhead, so that the operator can travel alongside of the instrument and direct the same.