

THE NEW GUNS FOR THE NAVY.

While the English navy is being armed with guns of very complex structure, those of the American navy have for several years been growing more and more simple. At first the plan of having ornaments cast upon them was abandoned; then the enlargements in the form of bands around the muzzle and other parts were dispensed with; and now, as the last possible step in this direction, they are cast without trunnions, making the cannon a smooth lump of cast iron, without any ridge, corner or projection upon it. This modification is the subject of Dahlgren's last patent. He forms the trunnions of gun metal, cast in connection with a strap passing around the breech of the cannon, and secured by a hoop of the same material passing around the cannon near the trunnions. At the Brooklyn Navy Yard there are a number of guns constructed in this manner, and several have been put on board of our naval vessels. In our opinion they are the best cannon that have ever been made.

It has long been known that corners or angles in the surface of cast iron rendered it much more liable to break. The rollers of rolling mills are now turned with a curve at the shoulder of the journal, it having been found that they were apt to break at this point; and the introduction of a curve occupying only half an inch in the length of the roller is said to increase the strength about 30 per cent.

The liability to break at the corners is greatest when the metal is subjected to blows or concussions, and is especially marked in cannon. This has been the reason for dispensing with ornaments and projecting rings, and for several years our service guns have been cast with no angles except those at the junction of the barrel with the trunnions. It being observed, however, that the guns were very apt to fail at this point, Commander Dahlgren was prompted to devise some mode of overcoming the difficulty. That which he has adopted seems to be as simple and efficient as it is possible to imagine, and gives a very perfect cannon.

In the present state of knowledge in relation to ordnance, the question seems to be between the guns of Dahlgren and those formed of a cast-iron core surrounded with wrought-iron or steel bands, on the plan of Prof. Treadwell, Blakely and Parrott. We have heard it suggested by one of our most intelligent mechanics that if the band is made of wrought iron it may take a permanent set from the momentary expansion of the elastic cast iron, and thus become loosened. He states that he has repeatedly broken a string by tying it very tightly round a thin gun barrel and discharging the gun, demonstrating the fact of such momentary expansion.

STEAM ENGINES ON COMMON ROADS IN SOUTH AMERICA.

In 1861, two of Boydel's traction locomotives for common roads, were imported into Venezuela by Messrs. Willet and Las Casas, who had obtained a grant for the exclusive use of such engines on all the roads of the Republic for ten years. Each engine weighed eleven tons, and had cylinders of 7-inch diameter, and 20-inch stroke. The great peculiarity of these engines consists in each having two large driving wheels, which carry an adjustable endless jointed railway. On the Venezuela engines each driving wheel is 6 feet in diameter, and there are two small steering wheels in front. The large driving wheel was furnished with 96 teeth on an inner rim, and it received its motion from the piston through pinion gearing, similar to that of several engines for common roads which have been illustrated in the SCIENTIFIC AMERICAN. The parts of the two engines were put together at La Guayra, and their route was to Caraccas, distant only seven miles in a straight line, but 27 miles by the wild, crooked mountain road, which rises one foot in seven, and attains a total elevation of 7,000 feet. We have been informed by a gentleman from Venezuela, that these engines traveled up this steep road, drawing several cars with perfect safety, and yet it is a dangerous pathway for single horse carriages, as it is so narrow in some places that there is scarcely a foot to spare between the pathway and precipices one thousand feet in depth. The people of Caraccas were astonished when they beheld these engines traveling up their mountain road, entering

their town, and turning their narrow streets with perfect ease drawing ten wagons loaded with coal behind them. This is the greatest feat of mountain traveling, we believe, that has ever been performed by the steam engine.

RECENT AMERICAN INVENTIONS.

Submitting Yarns to the Action of Liquids.—The principal feature of this invention consists in the use of two reels, arranged upon the same shaft, with the slats of one alternating with those of the other; one of the said reels being arranged eccentrically to the other, and the slats of one having longitudinal reciprocating movements; the object being to wind the yarn or thread spirally upon the reels, and keep shifting the spiral coils gradually toward one end of the reels, from whence it is delivered. The reels may revolve in a liquid for subjecting the yarn or thread to the action thereof (dyeing, sizing, &c.), or may revolve in the air for drying the yarn or thread, after having been subjected to the operation of a liquid. Patented by Paul Heilmann, Mulhouse, France.

Repeating Firearms.—This invention, patented by E. M. Judd, of New Britain, Conn., relates to effecting the loading at the breech from a magazine of cartridges in the stock of the firearm, by the act of withdrawing a slide by which the breech is closed for firing. It consists, first, in certain means operating in combination with the said slide, to transfer the cartridges, one at a time, from the magazine to the barrel. It also consists in certain means operating in combination with the said slide and the loading apparatus, for the purpose of effecting the cocking of the hammer, that the loading and cocking operations may be effected by the movement of the trigger guard lever.

Liquid Vessels.—The object of this invention is to obtain a simple means of drawing coffee, water and other liquids from portable vessels, without having to draw from a faucet, or to raise or tilt the vessel, and it consists in having an inner shell, which is open at the bottom, and provided with an opening and valve in the top, suspended within the vessel from the lid or cover of the same by a helical or coil spring, the liquor being drawn from the vessel by simply depressing a short spindle, which, first closing the opening in the top of the shell, forces it down, and simultaneously therewith causes the liquids to discharge through the spout. Patented by J. Lawson Treat, of New York City.

Cheese Vat.—This invention, patented by F. X. Manahan, of Utica, New York, relates to an improved arrangement of means for heating the milk vat, or rather its contents, to a proper temperature, by means of a boiler or heater, so arranged in connection with pipes, cocks, and a supplemental or hot-water chamber, that the contents of the milk vat may be heated and graduated with great exactness or nicety, and the result attained with the least possible expenditure of time and fuel. It also relates to an improved means employed for keeping the hot-water chamber tight around the cock or faucet, through which the whey is drawn from the milk vat.

Foundations for Lighthouses, Cofferdams, &c.—This invention, patented by Louis Bail, of New Haven, Conn., consists in the employment or use of cast-iron plates, of segment form, provided at their inner concave side with flanges, to admit of the insertion of bolts to secure the plates together, and thereby form a strong metal cylinder, which, while in the course of construction is gradually filled with concrete or other suitable material. The object of the invention is to obtain a ready means whereby foundations for lighthouses and other structures, as well as coffer dams may be built of a material previously prepared, and which may be conveniently transported and expeditiously put together to form the foundation or structure suitable for sandy foundations.

Foot Warmer.—The object of this invention, patented by Solomon Hunt, of Danville, Indiana, is to obtain a simple, economical and portable device for warming the feet of a person in any apartment of a dwelling, or while traveling in any vehicle, which has the means of generating warmth in itself, and it consists in a peculiar arrangement of a radiator in a box or other case, in connection with a foot rest and flame of a spirit lamp, for throwing the heat of the gases from the flames by radiation, direct upon the soles of the feet.

Improvements in Cannon, &c.—This invention, patented by B. T. Babbitt, of New York City, consists in the construction of a piece of ordnance with a passage winding spirally round the bore and within the walls thereof, to serve for a circulation of water or air for the purpose of keeping the piece cool when in use, and for the purpose of cooling the casting in the manufacture of the piece.

Great Gas Explosion in Paris.

On the last day of the old year, 1861, a very disastrous explosion of gas occurred in the new and splendidly fitted-up casino of the Rue Cadet in Paris, by which four persons were killed, seventeen others were more or less seriously wounded, and valuable property to a large amount was destroyed. The premises were lighted with portable gas supplied by the Paris Portable Gas Company, which gas is made from coal or other materials that produce a highly illuminating gas, and is compressed to four atmospheres in large strong vessels which are sent from the works to charge smaller receivers on the premises of the consumers. Several of the large *cafés* in Paris are thus lighted by the Portable Gas Company, which supplies about 1,000 customers. M. Peregalla, the manager of the casino, became aware on the day previous to the accident that there was an escape of gas somewhere on the premises, and a workman named Basta, in the employ of the Portable Gas Company, was sent for to examine the apparatus. The meter was found to require cleaning or repair, and on the following morning, he commenced the work, which he continued till about a quarter to five o'clock, when suddenly a loud noise gave warning of a dangerous escape of gas. One of the servants of the establishment immediately ran to the receivers, which were placed near the top of the building, to turn the safety stop-cocks. He had just time to descend when a terrible explosion shook the whole neighborhood; the roof of the front saloon was blown up, and the shops in the vicinity were much damaged. The counter in a wine seller's shop, next to the casino, was forced more than a yard from its place, and killed a workman who was drinking a glass of wine close to it. After the explosion, the premises took fire, and the flames burst out with such fury that notwithstanding the prompt assistance of the firemen, much property was destroyed, and the beautiful saloon which had cost \$80,000 was reduced to ruins. The gas company's workman was killed by the explosion, and his body was found on the ruins burnt to a cinder. Another man who was close to him was also killed; and as they were the only persons near the apparatus, it cannot be ascertained how the leak of gas took place. It is stated by those who heard the explosion that several detonations, like the reports of 64-pounders, took place one after another for about twenty minutes. The street was filled with ruins, and the people were terror-stricken. Suits have been commenced against the Portable Gas Company for damages they being the cause of the disaster through a defective gas receiver.

Secession Compliment to Our Navy.

The Richmond *Dispatch* of the 22d of Feb. pays the following extraordinary compliment to the Federal navy. We quote:—

There is no disaster of the present war which it is so difficult to bear with any degree of patience or philosophy, as the almost uniform success of the enemy's gunboats over our land batteries. It is a thing absolutely unprecedented in its extent, in the history of warfare. In nine cases out of every ten which have ever occurred before, land fortifications have driven off vessels as often as they attacked them. In the Russian war the immense steam navies of England and France were beaten by the Russian fortifications in almost every encounter.

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