

It can hardly escape notice that this carriage, having no arrangement for compound or muzzle-pivoting, requires a greater vertical height in its port than the turret pattern, although 9 deg. elevation and 7 deg. depression only are provided, as compared with 13 deg. elevation and 6 deg. depression in the turret 10 in. carriage. In any comparison of the two designs, however, we must take into account not only the different objects to be fulfilled, but also the fact that in a measure the gear shown in our engravings corresponds only in part to that of the turret carriage, and in part to that of the turret itself. To expose the above carriage to the fire of shells would seem an act of barbarity of the same character as that of exposing a steam engine or clock train to the same treatment. This, however, is not ordinarily done on service. The carriage is much more likely to be injured by its own gun than by that of an adversary. Hence the soundness of Capt. Scott's principles of design with the low centre of gravity and low application of the shock of discharge, which, as far as practicable, abolish the twists and blows caused by the mechanical couples which arise when the shock of discharge is given to a gun at a considerable height above the sliding surfaces of its carriage. In this respect this carriage compares favorably with the turret pattern, although in originality and completeness the preference must be given to the latter, especially in its aspect of the medium through which the gun is laid.

The quarter gun of a centre battery has a second port and set of rollers, and a so-called water pivot—truly speaking, a hydraulic lift—provided to enable it to be bodily transferred from one set of rails to another, in a manner analogous to that of a railway engine. In the cut beneath the sponge and rammer, is shown the cover of the opening through the deck into the shell-room below, through which opening the projectiles are raised ready to hand, being carried on board filled and fuzed. In the same cut is shown a Palliser projectile suspended in front of the muzzle of the gun. The chains seen crossing the sill of the port are those by which it is closed and opened.

#### THE SECURING OF WATER PIPES AGAINST FROST.

Mr. J. A. Calantarients, surgeon, Scarborough, has patented a simple but ingenious method of preventing water pipes from being burst by frost. Water, in freezing, expands about a twelfth of its bulk, and within that limit the expansive force exerted is so enormous as to overcome the resistance of any pipe or vessel yet constructed. Mr. Calantarients solves the difficulty by passing through the water pipes an indiarubber tube of such diameter that the space inside is a little more than equal to the increase in volume of the water by freezing. There is thus secured in the inside of the pipe a space equal to the difference of volume between water and ice—the proportion being 1,083 to 1,000—so that when the water freezes and expands it occupies the space thus reserved for it instead of exerting its force on the pipe. The indiarubber tube is always kept full of air, so that when the water freezes it finds at every point the necessary space to occupy, for by compressing the tube it displaces the air and takes its place. Again, when the ice melts the air-tube expands, ready to be acted upon by another frost. The air is supplied from a reservoir, which is acted upon by the water-pressure, so as automatically to put the air-tube under an exactly corresponding degree of tension. By heating the air in the tube the water in the pipes can be thawed. This application is peculiarly useful in the case of water-closets, and in preventing the supply of cold water to engine-boilers becoming interrupted by frost. Not less important is that the invention can be applied to preventing the explosion of kitchen-boilers.

There is little doubt that we have here a cheap but effective remedy against a fertile and long-standing source of discomfort and damage. Incidentally, security against the bursting of water-pipes during frost will likewise facilitate their more convenient disposition throughout a house, and permit the use of much lighter and consequently cheaper kinds; while it has been proved, by repeated experiment, that the invention retards the freezing of water in pipes, and that a frost which will close unprotected pipes has no effect upon those containing air-tubes.

TILSONBURG is going to vote on a by-law for the introduction of the Waterous system of water-works, to cost \$13,000, on the 27th inst.

#### DOMINION NEWS.

THE Brockville *Enterprise* says:—The Canada Central Railroad is at once to be extended to Pembroke. At Renfrew the Kingston and Pembroke will amalgamate and use the one line through to Pembroke.

WORK has commenced on the Northern Colonization Railroad at Lachute, where the contractors complain exorbitant prices for the right of way are being demanded. The Company has been interviewing the Government with a view of getting permission to build the Gatineau Bridge 40 feet instead of 60 over low water mark.

MR. BULKLEY, C. E., who has recently returned from England, has made all requisite arrangements for the development of the Harewood coal mine, Nanaimo. Men are engaged at work tunneling.

THE plan of the proposed water-works for the town of Port Hope consists in the placing of two rotary pumps, two double turbine wheels, so arranged that either wheel will drive either pump, with fourteen hydrants distributed over the principal streets of the town, and necessary pipes and ceteras.

THE Yarmouth, N. S., *Herald* says a brick of native gold weighing 27½ ounces, the produce of the gold mines at Cranberry Head, was shown us yesterday by Capt. Coxetter, proprietor and manager of the mine. This lump is worth over \$600. Capt. C. expects a yield of 80 to 100 ounces per month from the mine, with the aid of between 20 and 30 men. We are glad to learn that the prospects are so encouraging.

THE first car for a line between Toronto and the oil regions at Parkerbury, Virginia, has been built at Port Hope, to the order of Stock & Webster, Toronto. It is meant to be fitted with a large iron tank 25 feet long by 5 feet in diameter. At each end movable head blocks are placed, so that the tank when placed upon it can be firmly fastened by bolts, thus avoiding the possibility of its shifting from its proper place upon the car, and as the trucks are on the anti-friction principle the oil can be carried steadily, avoiding the unsteady motion of the ordinary truck.

ACCORDING to the annual report of the Welland Railway the expenses, for 1873 were \$1,970.08 less than for 1872, while the amount of traffic, and consequently of the receipts, was largely increased during the last year over the previous one, the net profits, after deducting running and other expenses, amounting to \$39,025.46. Over 3,000,000 bushels of grain were shipped over the road in 1873, being over 223,000 bushels more than during the previous year. Over 37,000 barrels of flour were carried over the road last year, being 10,000 barrels more than for 1872. Very satisfactory arrangements have been made with the Great Western Railway Company for running over a portion of the line. The cost of changing gauge, replacing rails, and other necessary work, was only \$10,000. The local traffic of the road, both in passenger and freight shows a very considerable increase.

DEPRESSION IN THE COAL TRADE.—Our latest advices from the Reserve and Lorway Mines are:—That twenty-two pair of cutters and a number of over ground workmen have been discharged, amounting in all to some 60 men, on account of the depression in the coal trade. A large contract the company had to fill in Montreal, of 76,000 tons, has been cancelled, buyers preferring to pay the amount of bond they were under to receive the coal than to take it and sell at such a disadvantage as the low price of coal in the market would force them to do. The bank at the Reserve contains some 40,000 tons, while at the Emery, where work is still going on, and we hope it may be continued, about 20,000 tons of the black diamonds are in bank. We sincerely hope this stoppage of the extensive works heretofore carried on at the Reserve Mines is only temporary, and that our coal prospects will brighten up at once. The determined push of the proprietors of these mines cannot be questioned, but wealthy corporations feel no more inclined to fight against untoward circumstances with daily loss of capital than do individuals. We look forward with hope that the "Reserve" will soon be in full blast again.—*North Sydney Herald*.