

SANBORN'S RAILROAD RAIL.

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is steel. The rail used in practice would be four inches high and four inches wide at the base, which, it will be noticed, is slightly arched. The sides approach at the neck, C, to within about a quarter of an inch of each other. Now it will be readily seen that the effect of a weight applied on the top of this rail will be to bring the sides nearer together at C. A sufficiency of pressure would make them touch. There will, at the same time, exist a lateral thrust of the lower sides which will tend to flatten out the arched base, the yielding of which brings into play a reserve of elasticity that is available after the sides are closed at C. The closure of the neck effects a slight change in the form of the arch at the rail top, which enhances its strength without sensibly affecting its bearing surface. The joint, B, is, in effect, a hollow spring of about sixteen inches in length, which is compressed when inserted in the ends of the rails to be connected. It binds them securely and is capable of yielding with them to the influence of pressure or percussion. The joined rails are shown at Fig. 2.

Finding that there was a practical difficulty in manufacturing the exact form of rail just described, which arose from the weld required at the base, Mr. Sanborn devised the form shown in Fig. 3, which was patented December 12, 1871. Here a separate base is secured to the body of the rail by a lap joint as delineated, which very much simplifies the construction. The elliptic form of the top arch and the configuration of the connecting spring, B, shown at Fig. 4, forms the subject matter of a further patent dated March 26, 1872. In this form the sides are at once connected with the base without being doubled over, as in Fig. 3. The elliptic arch affords a wider tread for the wheels, and the connection is rendered more secure by the enlargement of the spring joint.

The three forms of rail described are similar in principle, so far as their elasticity is concerned, and in each case the limit to the yield or give of the rail is fixed by the space left between the sides at C, and by the arch in the base. The inventor claims that by this arrangement the tread is not affected by pressure sufficiently to produce an up grade for the wheels to run on. The tubular connecting joints make, virtually, a continuous rail. The junctures are made without bolts or other fastenings, and allow of expansion and contraction taking place freely while keeping the rails securely in position. In this way the violent hammering arising from the wheels striking the ends of the ordinary T rails is obviated, and consequent damage to the rails and rolling stock is prevented by the elasticity of the joint.

The rails made as in Figs. 1 and 2 have the advantage in strength and durability, and those constructed as in Figs. 3 and 4, with lap joints, possess that of cheapness. The elliptic top may go with either construction. The inventor states that all the forms presented can be readily manufactured. The first form he proposes to make by passing a round tube of proper size through rolls constructed to press it into the required shape. The other forms, and the connecting pieces for all, may be made of rolled metal plate of the requisite thickness. He claims that a length of rail of this kind, weighing forty pounds, has as much strength as a similar length of solid rail weighing sixty pounds, and that great economy of material will consequently arise from the use of the new rail.

Mr. Sanborn designs placing his invention under the control of a stock company, by whom it would be tested and its practical worth fully developed.

CANFIELD'S RAILROAD CAR BRAKE.

This is an American invention, for an illustration of which we are indebted to the *Scientific American*. The patentee is Mr. Frederick A. Canfield, of Dover, N. J., whose name we hope to see shortly among the list of inventors taking out patents in Canada. His improved brake, illustrated on page 61, is more especially adapted for use on four wheel coal cars, or such cars as are generally used about furnaces, though it admits of various modifications of its arrangements which would adapt it to other forms of car, without altering the principle involved.

Fig. 1. represents a coal car with the brake applied to one pair of wheels. Only the upright shaft and handwheel are shown in the illustration, the other portions of the brake being indicated by dotted lines.

Fig. 2 shows the side frame of the car, in section, with the brake attached. At A are shown the brake blocks, which are made of wood or other suitable material. These are attached to a firelock iron strap, B, the ends of which are secured to the frame of the car by the nuts and screws shown at C. This strap is about three inches wide, and a quarter of an inch thick. D is a vertical brake rod which is operated by the wheel seen in Fig. 1. On the lower part of the brake rod is a screw which works in the nut E, attached to the frame of the car, and on its extreme end is the block F, which has a groove lengthwise through which the strap passes. It is prevented from falling out by a pin. The end of the brake rod works in a socket in the block in such a manner as to raise or depress the block without turning it. When it is desired to apply the brakes, the rod is screwed down by means of the wheel, and the strap is carried down with it. This brings the blocks, A, in contact with the wheels of the car, and throws part of the weight of the car upon the brakes. The amount of weight sustained by the brake blocks is dependent upon the pitch of the screw on the rod, D, and upon the diameter of its wheel. When the brake is not in use, the rod, strap, and brake blocks are elevated sufficiently to relieve the wheels of all restraint. Should the strap stretch, it may easily be brought to the proper tension again by tightening the nuts at C.

It will be noticed that the brake blocks are applied directly on the top of the wheels, which prevents the steam coming upon the boxes as it does when they are placed in any other position. On gravity roads this brake is said to work admirably. One in use on a road having a uniform grade of 200 feet per mile, did all the braking up of five cars for six months, and has been running in all two years in good order. It appears to be durable, and costs only an insignificant sum to keep in order.

Professor Nagel, of Tubingen, has successfully used strychnia as a remedy for falling sight. One-fortieth of a grain, mixed with water, is injected under the skin of the arm.

EXTINGUISHING FIRES.—A correspondent of the *Scientific American* makes the following suggestion to parties who purpose building large warehouses or business blocks. In some part of the cellar, build a tank that will hold enough acid and marble dust to generate, when mixed, gas enough to fill the building. Let the stop-off arrangements extend to the outer part of the building; and when a fire occurs and gets beyond the control of the portable extinguisher, turn on the large one. In warehouses, the gas could ascend through hatchways; in other buildings, flues in the walls connecting with different floors would be necessary.

A NEW BUILDING MATERIAL.—A new kind of material, called "Mezzo marble," has just been introduced in England, and seems to create attention among all the architects and decorators. It is a material professing to have all the qualities of marble, not only as to beauty of finish but durability, and can be produced at one-tenth the cost of marble, and one-half that of scagliola or enamel slate. A large number of architects and other visitors were recently invited to see the works in London, and a very fine specimen of the workmanship—a splendid fountain, which is intended to be shown at the forthcoming Dublin exhibition, previous to its removal to one of the seats in Ireland of Sir Arthur Guinness.

One of the most simple modes of preventing boiler incrustations would appear to be that which, we find stated, has now for a long time been in use at the Darmstadt gas works. The engine is worked day and night, almost without interruption, and the formation of calcareous deposits has been entirely prevented by the use of crude pyroligneous acid combined with tar—being either introduced into the boiler or mixed with the feed water. Since this mixture has been in use they never have had a stoppage through incrustation, and have never had to use a hammer to remove scale. Each year, during the summer, when less gas is required, the boiler is opened, and perhaps a couple of handfuls of loose sediment taken from the bottom. The quantity of substance thus employed is very small—just enough to redden the litmus paper; consequently the iron is not attacked, and of course the boiler rarely needs any repair.

According to *Les Mondes*, M. Ferdinand Tourmasi is the inventor of a new method of telegraphing through tubes filled with water, which he is at present exhibiting at Paris; the tube is of copper, 1-16th of an inch in diameter. The experiment is made with a length 3,280 feet, and the inventor hopes to obtain, first, a speed of transmission of at least 600 signals a minute, even through a length of 1,000 miles; second, a simultaneous exchange of correspondence by the same tube—that is, to signal both ways at once; third, the facility of printing despatches; and fourth, a very small cost of construction. The thread of water is in communication at each end with two pistons of the same diameter. One of these pistons is slightly pressed, and the motion is immediately transmitted to the other piston. The tubes and its pistons are in connection with an electro-magnetic apparatus to facilitate the transmission and the reception of messages.

IMPROVEMENTS IN BLASTING.—The Servian mining engineer, T. Klerity, has lately introduced an improved blasting cartridge, which is said to save much powder or dynamite, and seems to be worth a notice. The new feature of it consists of a cast-steel cylinder, which is inserted in the cartridge, and replaces a part of the powder, which is ignited through a touch-hole in the cylinder. At both ends the cylinder is very nearly the calibre of the bore hole, but its middle part, for about 3/4ths of the whole length, is reduced to half that diameter. This thin part has a channel bored through it at right angles to its axis, while another vertical channel follows the axis from the top until it reaches the transverse passage, both of which are filled with fine-grained powder, and ignited in a suitable way. The length of the steel cylinder is 12 or 14 in., and its diameter 1 to 1 1/2 in. at the ends, and 1/2 to 3/4 in. in the middle. It is inserted in a cylindrical paper bag, and the powder or dynamite filled between the reduced diameter and the paper; it is then placed in the bottom of the blast hole, covered with a certain thickness of tamping, and fired in the usual way, through the channel in the centre. Another improvement with the use of dynamite has lately been made at Raib, in Carinthia, where the dolomitic limestone is very cavernous, and much of the power of the explosive is lost, its gases expanding uselessly into these cavities. In order to prevent this, a watertight dynamite cartridge is introduced into the bore hole, and before firing it, as much water pumped into the same as it and the next adjoining cavities would hold. Through this very simple expedient a wonderful effect is said to have been produced, by which half of the former expenses of blasting were saved.

IMPROVEMENT IN STREET WATERING.—An official trial lately took place at Hyde Park Corner, Knightsbridge, Eng., of the system for watering streets, public parks, and market gardens, patented by Messrs. Isaac Brown & Co., Edinburgh. The patented apparatus was shown upon the drive at the east end of Rotten Row, Hyde Park, and upon one of the large enclosed flower plots, which has been fitted with it by order of Mr. Ayrton, her Majesty's First Commissioner of Works. In one of the illustrations of the new mode of road watering, one and one half inch lead pipes are laid along close to each kerb stone, these subordinate pipes being supplied from the mains. At intervals of about two feet apart, the pipes are drilled with small holes of from a sixteenth to a thirty second of an inch, in groups of three, each of which is pierced at a different angle. These apertures from the pipes command the complete road, which at the place where they are exhibited is about nineteen yards wide. The water is, of course, supplied under pressure, with a head of about 100 feet, and a shower of a quarter of a mile in length can be commanded with a one and one half inch pipe. The other experiment for road watering was by a central pipe in the middle of the road, which throws its jets towards the kerb stones. The pipes are protected by shields, and provision is made for the surface water being sent past the sides of the pipe to the bottom, where it finds a passage. The central pipe is of course upon the crown of the road, and is protected by an asphalt covering. An apparent objection may be that the small apertures may get choked up by the debris of the roads. In practice, however, this is found not to be the case, as the pressure of the water, when it is put on, keeps the drilled holes open. In winter, when there is the danger of freezing, the watering pipes are kept empty, which is not found to be a matter of much practical difficulty.

MISCELLANEOUS.

It has been proposed to place a painted window in Westminster Abbey to the memory of the officers and men who went down in the Captain.

A writer in *The Field* states the very curious fact that a hen, after hatching out two ducklings from eggs placed under her for that purpose, and attempting in vain to induce them to come out from the water to which they had immediately betaken themselves, herself swam in after them, and pushing them before her, actually forced them to the land.

The Agricultural and Arts Association of Ontario has determined to hold two grand Provincial Ploughing Matches this season, at a date subsequent to that of the Provincial exhibition, and to offer \$400 in prizes at each match. One of these matches is to be held within 20 miles of Belleville, or between Belleville and Kingston, and the other near London. Tenders are asked for 30 acres of land for each match, and implement manufacturers and others are invited to offer supplementary prizes.

The word "sheepish" has altered curiously in meaning since the twelfth century. In some old English Homilies, of which the MS. is in Trinity College, Cambridge, and which Dr. Richard Morris is now editing for the Early English Text Society, "sheepish men" are thus defined. "Some men lead a pure life, and neither do or say anything unpleasant to their fellow-men, but love God, and go each day to church, as sheep to the fold, and give gladly their dues to the church, and alms to poor men, and beth ycleped *sheepess men*," (are called sheepish men)."

A CANADIAN CLAIMANT UNDER THE WASHINGTON TREATY.—An examination of Robert Wray, Esq., of Quebec, and other witnesses, to substantiate the above claim has been opened at Kingston, at the U. S. Consul's Office, before John Mudie, Esq., barrister-at-law. Colonel Hance appeared as counsel for the United States, and G. A. Kirkpatrick, M. P., for the claimant. The evidence was very interesting, and the battle grounds of South-west Missouri were gone over in succession. The history of Mr. Noble's arrests, hardships and privations would form an interesting chapter. He claims \$300,000 for damages to property, loss of business, &c., &c., and as his claim has already been accepted as coming within the jurisdiction of the Washington Treaty, we have no doubt of his receiving a large compensation.

BLOOD DRINKERS.—A Paris letter writer says:—"We have a society of 'blood drinkers'—not the wildest wretches of the Commune, but quiet, orderly-loving citizens. The abattoir of Paris is situated at La Villette; at 10 o'clock in the morning the slaughtering of the animals commences. It is at this moment invalids suffering from impoverished blood or consumption answer the ringing of a bell, step into a room where they are served with a glassful of the life blood of sheep and oxen, hot, and even steaming. It is said excellent results have followed this strange cure. There is also fitted up in the same place a bath-room, where persons—children especially—suffering from weak limbs or general debility can take a dip in the water in which the tripe has been boiled for the market. The later mode of treatment I have witnessed."

The *Court Journal* is responsible for the following story. Two gentlemen were conversing the other night not very far from the lobby of the House of Commons, and immediately after a debate in which the Premier had taken a prominent part. The speakers were a well-known member of the House and a distinguished Prussian nobleman. The conversation turned upon the Berlin Vatican troubles, and the M.P. said smilingly, "Ah, Count, I wish you would lend us Prince Bismarck for a short time; he would soon settle our Galway troubles." The Prussian smiled assentingly. "And," continued the member, "not to take an unfair advantage of your generosity, we would lend you"—"Mr. Gladstone in return," he would have said, but the indignant German cut the sentence short. "No, sir," said he fiercely, "take Prince Bismarck, if you please. He is not my idea of statesmanship. Take him and keep him; but for your Mr. Gladstone—thank you, no!"

The *Pall Mall Gazette* says:—"A musician at Huddersfield has just been sentenced to eighteen months' imprisonment for various little domestic offences, including the performance of the 'Dead March in Saul' over his wife during a severe illness. This gentleman was remarkable not only for his love of music, but also for his peculiarly playful disposition, for whenever any of the neighbours interfered to protect his family from ill treatment, he was in the habit of stoning them and bidding them 'stand their mark.' He seems to have undergone no little suffering, owing to the populace being unable to understand his temperament, and a few days before he was taken into captivity he was with difficulty rescued by the police from a mob who desired to lynch him. Yet, although at first sight it seems a mistake for a husband when requested by his wife to run for a doctor to play the 'Dead March in Saul' by her bedside instead of seeking medical assistance, it must not be forgotten that some of our best English writers have lent their sanction to this course of proceeding. For instance, Keats says, 'Let me have music dying and I seek no more delight.' Again, Milton remarks, 'I was all ear, and took in strains that might create a soul under the ribs of death.' And Carlyle speaks of music as 'a kind of inarticulate, unfathomable speech, which leads us to the edge of the infinite, and lets us for moments gaze into that!'"

DR. HOWE ON THE USE OF FELLOWS' HYPOPHOSPHITES.

PITTSFIELD, ME., March, 1872.

MR. JAS. I. FELLOWS—Dear Sir: During the past two years I have given your Compound Syrup of Hypophosphites a fair though somewhat severe trial in my practice, and am able to speak with confidence of its effects. In restoring persons suffering from emaciation and the debility following Diphtheria, it has done wonders. I constantly recommend its use in all affections of the throat and lungs. In several cases considered hopeless it has given relief, and the patients are fast recovering; among these are Consumptive and old Bronchial subjects, whose diseases have resisted the other modes of treatment. For impaired digestion, and in fact for debility from any cause, I know of nothing equal to it. Its direct effect in strengthening the nervous system renders it suitable for the majority of diseases.

I am, sir, yours truly,

WM. S. Howe, M. D.