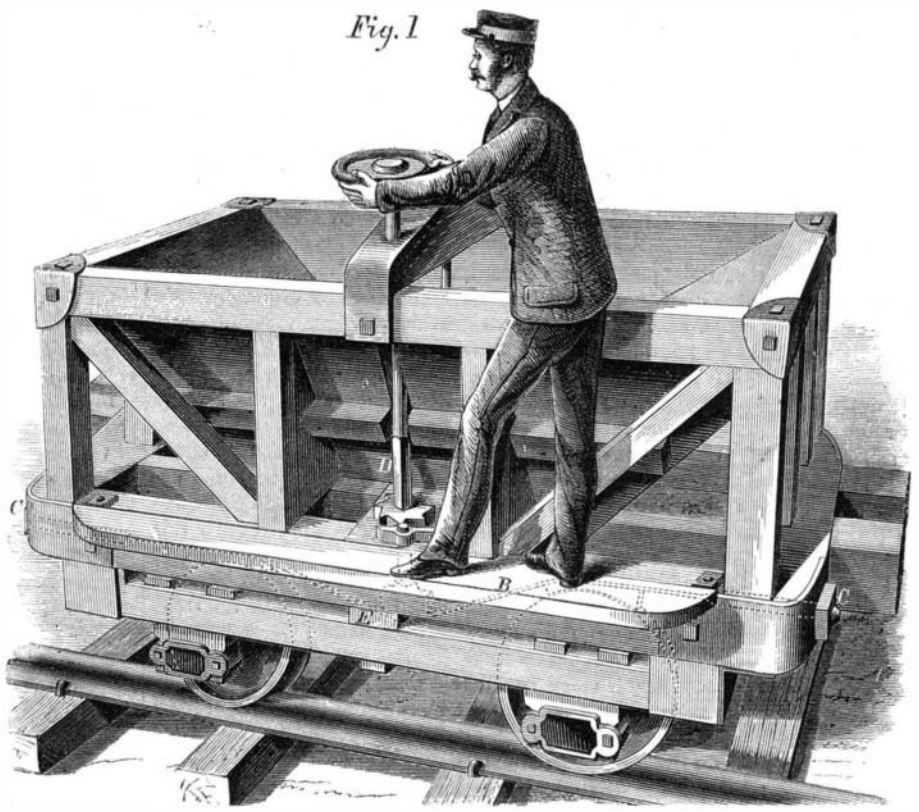
RAILROAD CAR BRAKE.

The improved brake illustrated in our engravings is more especially adapted for use on four wheel coal cars, or such ore cars as are generally used about furnaces, though it admits of various modifications of its arrangement 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 hand wheel are shown in the engraving, 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 flexible 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 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 be easily 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 strain 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. For further information, the inventor and patentee, Mr. Frederick A. Canfield, of Dover, N. J., should be addressed. Patented Jan. 9, 1872.



CANFIELD'S RAILROAD CAR BRAKE.

RAILROAD RAIL.

The improvements in railroad rails, which we this week illustrate, are designed to give to the rail that degree of elasticity which will enable it to bear all the pressure and shocks to which it may be subjected with the least possible amount of wear and tear to itself and the rolling stock which passes over it. To effect this much to be desired object, the inventor relies on the merits of the form and construction of his rail, the material of which it is made, and his method of joining the ends of adjacent lengths. Several designs for the rail are shown in our engraving, where, generally, A is the rail and B the connecting piece, all of which are secured by letters patent.

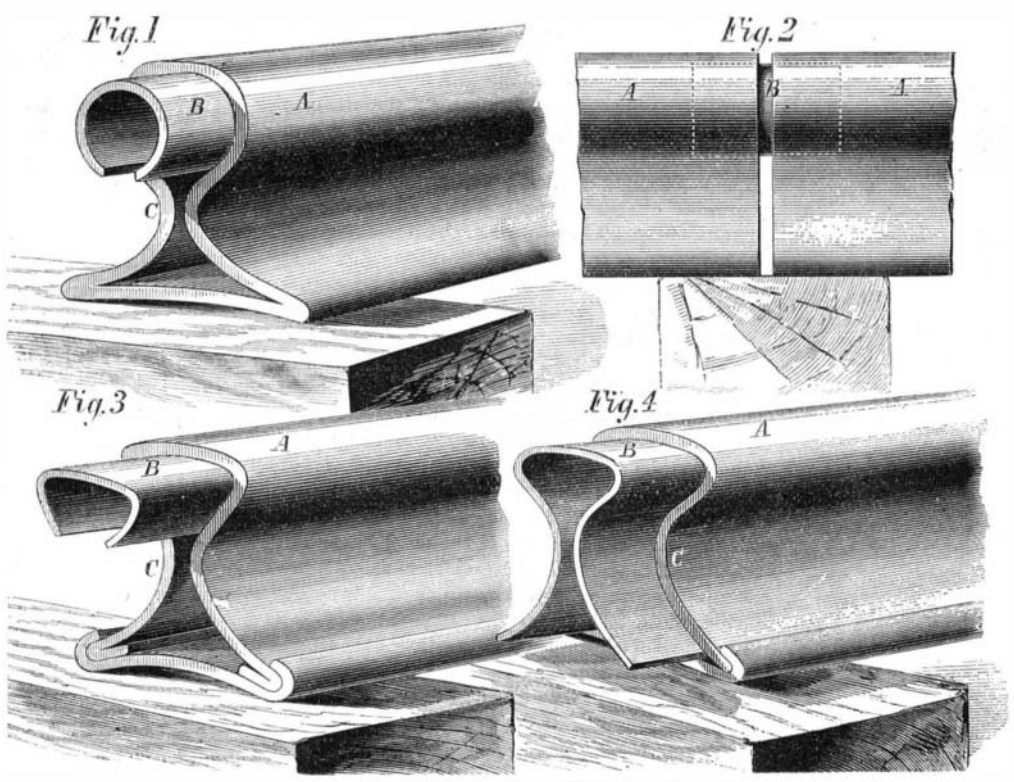
The first patent granted to the inventor, Mr. Rufus S. Sanborn, of Rockford, Ill., dated August 8, 1871, was for the rail and joint shown in Figs. 1 and 2. It will be seen that the rail is tubular, the upper part being nearly cylindrical and the lower somewhat of a triangular figure. The material of which it is formed 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 upgrade 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. He may be addressed, as previously stated, for further information on the subject.



SANBORN'S RAILROAD RAIL.

The Polariscope.

Most of our readers have seen an example of what is termed double refraction by looking at any object through Iceland spar, which is a crystallized carbonate of lime. When a piece of the spar is placed upon a sheet of printed paper or any other well marked object, two images of that object or print will be seen, each separated from the other by a small degree. If the rhomb of spar be turned slowly round with the same face resting on the paper, one of the images will be seen revolving round the other. By judiciously sawing the rhomb of spar in two and cementing the surfaces with Canadian balsam, one of these double images may be entirely got rid of; and a piece of Iceland spar thus treated, and which is now well known all over the world as a Nicol's prism, forms the means by which the great majority of the experiments with polarized light are at present made. This simple piece of apparatus is most extensively used wherever light and its various phenomena form the subject of research. No microscope of the better class is considered to be complete unless it has a polariscope attached to it.

The polarization of light may be employed as a means of chemical investigation. A few days ago, says the British *Journal of Photography*, a friend called upon us with two bottles of similar size and appearance, filled respectively with aqueous solutions of bromide of cadmium and bromide of ammonium, and labels on which he suspected had got "mixed up" just before being pasted on, leaving him in some doubt as to whether they were properly labelled. Instead of subjecting one of the solutions to an analytical chemical test, as had been suggested, we merely placed one drop from each of the bottles upon a small plate of glass, warmed it slightly to start the crystallization, and examined the two crystallizing solutions with the polariscope. In less than thirty seconds after placing the glass slide on the stage of the instrument, we indicated, in the most definite manner, which was the cadmium salt and which the ammonium. This is only one of many uses to which a polariscope may be put.

M. Blanquart-Evrard.

M. Blanquart-Evrard, recently deceased in France, aged 70, may justly be esteemed one of the early fathers of the photographic art, for he it was who first popularized its productions and proved that it could be applied successfully to the illustration of books. At the time when he first started his photographic printing establishment at Lille (1850), nothing was heard of in photography but daguerreotype portraits and prints from calotype negatives upon paper, in a rusty red, inartistic style. He began by entirely changing or reversing the process of Talbot in taking negatives, and established the principle which has since been observed in the common collodion process. He showed the importance of organic matter in the film as conducing to clearness and density. He discovered sulphur toning, as well as the gold toning of paper prints; and so modified the negative process of printing by development as to enable it to produce the most artistic photography upon paper yet seen. His latest discovery was a mode of intensifying a negative by exposing it with its back to the light for an hour two after it is developed but before it is fixed.