

IMPROVED RAILWAY TRACK.

The invention illustrated herewith consists in securing the rail upon an elastic continuous bed, by a simple method of fastening which dispenses with the nuts, bolts, and other means usually employed for that purpose. The principal advantages claimed are that the wear of rail and rolling stock will be lessened, and that there will be less probability of breaking rails owing to the elasticity of the bed.

A, Fig. 1, is a wooden beam which forms the bed upon which the rail rests. The base of the rail and all of the beam are inclosed in the space formed by the inverted T-shaped metal bars, B, one of which is shown detached in Fig. 2. These have inner base flanges which meet beneath the beam. The bars are tied together by metal plates, C, and screw bolts, the nuts of the latter being prevented from working loose by the elasticity of the wooden bar. The vertical part of each of the bars, B, is curved inward at the top, forming ribs which bear on the base of the rail.

The inventor states that the cost of altering the tracks of a road, to conform to the above described plan, will involve only the extra expense of a light steel or iron rail, as the old rails will make the flanged pieces, and the saving of ties, the sleepers. The flanged pieces are put together with alternate splices, and their hold on the rail increases proportionally with the load. They are easily loosened by inserting a bar under the bases and prying upward, this causing their upper portions to spread apart, when the rail and bed may be readily removed.

Patented March 3, 1874. For further particulars address the inventor, Mr. Geo. Potts, Unionport, Jefferson county, Ohio.

Uninflammable Products.

It is well known that certain substances, notably phosphate of ammonia, incorporated in the fibers of tissues render the same incombustible, or, rather, admit of their burning very slowly and carbonizing with the production of flame. M. L'Abbé Mauran, says *La Nature*, has recently discovered that a mixture of borax, sulphate of soda, and boracic acid, in suitable proportions, while rendering cloth uninflammable, will also prevent any alteration of color, flexibility, or lasting qualities through the effect of combustion.

IMPROVED FIRE BOX FOR LOCOMOTIVE FURNACES.

It is a common fault in locomotive furnaces, made in the usual way, that the flanges and rivets of the end sheets, at the points where they are connected to the side sheets, soon become burnt, and thus cracked and leaky. The result is that the end sheets have to be renewed several times before the sides are worn out, involving considerable trouble and expense. To obviate this difficulty, the invention illustrated in the annexed engraving has been devised, and it consists in forming the side sheets to bulge inward throughout the entire width, as shown in Fig. 2, at A; or where the central portion of the sheet is on the same plane as the joints, bulges, B, Fig. 3, may be made adjacent to the flanges to protect said joints. In Fig. 1 is given a view of the interior of the fire box, showing that the device causes but a slight modification of the usual form. By this means, it is claimed, the joints are protected from the intense heat of the fire, and are preserved and rendered as durable as any other portion of the furnace. The cost for the labor of making a locomotive fire box of this design is, we are informed, only three to five dollars in excess of that of constructing the box in the usual way. The iron for the side sheets is required to be from one and a half to two inches longer than when the sheets are made straight.

Patented through the Scientific American Patent Agency, April 27, 1875. For further particulars address the inventors, Messrs. W. Dawson and J. Hughes, Scranton, Pa.

Spirit Photography under a Cloud.

M. Buguet, of Paris, a spirit photographer, came to London early last summer, and, after advertising in this journal for premises, he obtained them, where he received many visitors and sitters. Was not the genuineness, it was asked, of the spiritual origin of the Buguet photographs attested by Mr. W. H. Harrison, a whilom contributor to this journal, and the present editor of the *Spiritualist*? And did not a whole host of *dilettanti*, including the names of some who stand very high in Science, say it was all correct? And were not all the uncles, aunts, grandfathers, grandmothers, and other relatives of several of the sitters recognized in these spirit photographs? All this, we admit, is quite true.

Returning to Paris from this country, and laden with what were the equivalents of testimonials from men of note—fellows of the Royal Society, lecturers in University College, editors, and simple commoners—M. Buguet practised "spirit photography" with renewed zeal in that gay capital. Par-

isian policemen seem to have been materialistic to an unusual extent; they wished to know more about this kind of practice. One fine morning two of the "force"—one of them an inspector, the other a photographer—called upon M. Buguet to have a spirit photograph taken. Waiting till the dark slide with its sensitive plate was about to be inserted in the camera, they produced their warrant, had a developer applied to the as yet *unexposed* plate, and saw a "spirit" developed.

Fig. 1

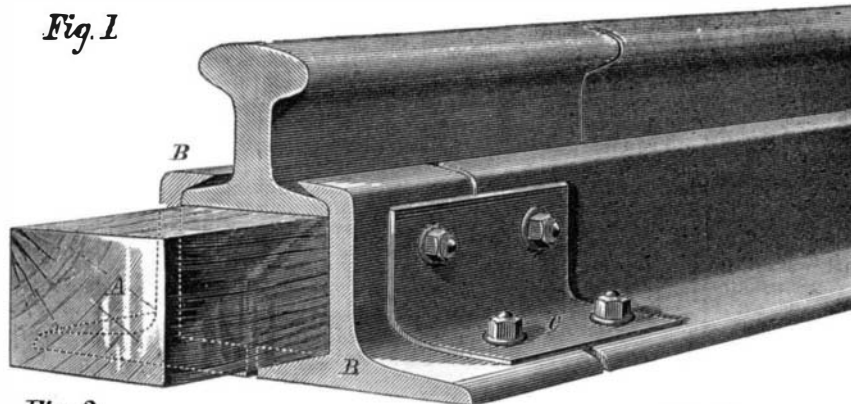
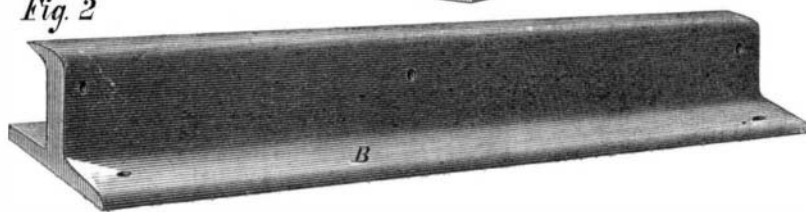


Fig. 2

**POTTS' RAILWAY TRACK.**

A search was then made, the originals of this and other spirit forms were discovered, and the ingenious photographer was subsequently lodged in "durance vile," from which, after confessing that he was an impostor, he was liberated on bail. In the meantime spirit photography has still many true believers in London; and, although the editor of one of the weekly periodicals devoted to this topic denounces Buguet as a "thorough scoundrel," that of the other looks upon him as a kind of Galileo, who has made a confession he knows to be untrue in order to be released from prison, quite overlooking the fact of the seizure, by the police, of the tools and implements by which the trade in the so-called "spirit photographs" was carried on.

It is said, however, that many of the "spirits" evoked by M. Buguet have been recognized. Far be it from us to say

road is the use of a jet of water against the rails, in front of the wheels of the locomotive, sufficient to wash the rails completely. It was observed long ago that the influence on adhesion of a slight humidity such as that deposited by a fog, and that of a veritable layer of water deposited by rain, are entirely different. On the Swiss Central Railroad, a jet of water is used on the front wheels of certain engines to facilitate the passage around curves, and the effect on the durability of the ties has been remarkable; but this jet of water, which was only intended to lubricate the inside part of the rail head, moistens the whole surface in contact with the tyre. No modification of the adhesion has been observed as the result of this; this jet of water does not dispense with the use of sand, while at Uetliberg absolutely no use is made of sand, but water is employed exclusively.

Another Swiss mountain railroad, the Rigi Kulm and Lake of Zug line, is about seven miles long; six miles of it are worked with a peculiar cogged wheel arrangement, or something similar in effect, by which grades of 1,056 feet per mile are surmounted, there being one section more than a mile and a half long with a grade very little less. The radii of the curves, which are uniform, is 600 feet.

Water and its Inhabitants.

The quality of water in relation to its fauna and flora has been the subject of investigation by some of the French Academicians. In substance, the results seem to prove that water in which animals and plants of higher organization will thrive is fit to drink; and on the other hand, water in which only the infusoria and lower cryptogams will grow is unhealthy. If the water become stagnant and impure, aquatic plants of the higher order will languish and disappear, and the half-suffocated fish will rise near the surface and crowd together in parts where there may still be a little of the purer element trickling in, and if driven from these places they soon die. *Physa fontinalis* will only live in very pure water; *valvata piscinalis* in clear water; *limnæa ovata* and *stagnalis* and *planorbis marginatus* in ordinary water; and finally, *cyclops corena* and *bithynia impura* in water of middling quality; but no mollusk will live in corrupt water. Plants also exercise a reactive influence on the quality of water. The most delicate appears to be the common water cress, the presence of which indicates excellent quality. Veronicas and the floating

water weeds flourish only in water of good quality. The water plantain, mints, loosestrife, sedges, rushes, water lilies, and many others grow perfectly well in water of moderately good quality. Some of the sedges and arrowheads will thrive in water of very poor quality. The most hardy or least exacting in this respect is the common reed, or *phragmites communis*.

It is said that iron goods treated as below described, acquire a bright surface, having a white glance without undergoing any of the usual polishing operations. When taken from the forge or rolls, the articles are placed in dilute sulphuric acid (1 to 20) for an hour; they are then washed clean in water, dried with sawdust, dipped for a second or so in nitrous acid, washed and dried as before, and finally rubbed clean.

DAWSON & HUGHES' LOCOMOTIVE FIRE BOX.

that they have not; but we do not travel beyond our own experience in such matters when we assert that a muslin mask, fastened upon the face of a courageous medium, has been recognized, by a person of more than average intellectual powers, as a deceased relative; and that in a deposition of silver on the back of a wet collodion plate, caused by contact with our own fingers, the bearer of a name well known in spiritualistic circles has recognized a visible manifestation fraught with much interest. Surely, one might say, if spirit photography be the incontestible fact some people say it is, there ought not to be much difficulty in convincing the world of the reality of such fact, and this opinion we endorse.—*British Journal of Photography*.

SIR JOHN FRANKLIN'S widow is hopelessly sick

