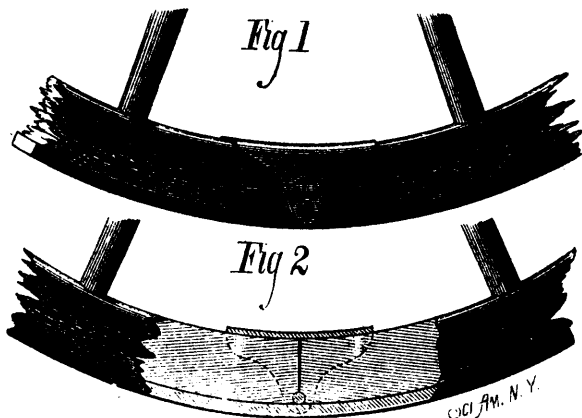


### IMPROVED FELLY PLATE.

The annexed engraving shows an improved attachment for vehicle wheels, which is intended to strengthen the felly joints and at the same time keep the tires in place on the wheels. The device is exceedingly simple, being nothing more than a curved plate fitted to the rounded portion of the felly over the joint and held in place by a single bolt passing through the joint near the tire. The extreme ends of the plate project over the edges of the tire and prevent it from running off should the wheel shrink.



### THE TAY BRIDGE ENQUIRY.

On reading the evidence given before the Court of Enquiry on the Tay Bridge disaster, it is difficult to say whether the result is more painful and humiliating to those concerned in the designing and building of that ill-fated structure or to the public. We have ever been justly proud of the excellence of the designs of our engineers, and not less so of the stability of the work of our leading contractors. No Englishman could look upon the achievements of our Brunels and Stephenson, nor at the handiwork of our Petos and Brasseys, without a feeling of exultation; but, after reading the evidence as to the design and workmanship of this unfortunate bridge, our pride receives a fall, and we feel as though we must write up Ichabod.

It would be out of place for us to attempt to attach or apportion any blame to any one, but we can at least say that such evidence as has been sworn before the Court ought not to have been possible in connection with any English engineering work. To hear of columns cracked and stopped up with Beaumontague, of missing lugs burnt on, of metal so full of cinder that it seemed on stirring it as though it would all turn to scum and dross, of scabbed castings, of bolts and rivets without heads, or even missing altogether; these are not the things we either expect or can tolerate in English work.

As we have before said, it is not for us to attach blame to any one; but we shall not be going beyond just criticism in saying that there must have been something radically wrong somewhere, and that the Court of Enquiry ought not to hesitate in sifting the matter to the bottom. It is for them to judge of the value of the evidence adduced, and form their opinion thereon. We hope they will allow no consideration of feeling or pity to stand in the way, but will mete out such judgment as the case deserves. To do otherwise would be to leave the public to have no faith in other works which may be all that the Tay Bridge ought to have been and was not.

While on this subject, we may observe that there seems to be manifold evils and dangers about the whole modern system of contracts. Contracts are too frequently let at a price less than the honest value of the work if properly executed. Under such a system, sound, honest work becomes almost impossible to obtain; the contractor cannot do his duty except at ruinous loss to himself. Such a system is vicious at bottom, and the sooner it is changed the better for engineers, contractors and the public.

### STRUCTURAL CHANGES IN WROUGHT IRON—BRIDGE ACCIDENTS.

A correspondent of the *Railway Age* writes, in regard to a change in the tensile strength of iron as follows: I have collected and sent to you some iron bolts, links, etc., that have been in use a long time (I wish I knew how long); they are broken short off and exhibit in the fracture all the appearance of cast iron, showing that even the very best wrought iron, such as is selected for links and link-pins, undergoes a radical change in structure by long usage in a continuous state of vibration, which seems to be violent enough to rupture the fibres of the iron and to totally destroy their continuity. Now I have reason to believe as the result of observation, that the metal of an iron bridge is subjected to a continual and almost uninterrupted succession of concussions while in a state of extreme tension, precisely similar in effect to those sustained by a link which connects a long freight train with the engine. Lateral jerks, without tension, seem to produce the same effect upon the large vertical bolts which connect the body of the car with the truck.

When you look at these specimens you will think I have some cast-iron bolts made and boxed them up for you, for I believe they can all be broken short off with a sledge. One of them I saw broken myself, opposite the depot with a sledge to detach it from the draw head. It was intended only to loosen the bolt, but it broke like a pipe stem. This bolt or pin of iron from appearances, has been in constant use for 10 years.

It is a singular fact that in the conclusion reached by committees of investigation of bridge accidents, no thought of a possible deterioration in the tensile strength of the iron, ever enters their minds. The verdict is, universally, that the plan of the bridge was perfect, and the cause of its fall involved in mystery. They never seem to suspect that the bridge fell because it was too weak to stand, although it would appear to be a palpable fact. How strange that it never occurs to them that, however strong the bridge was originally, so strong as to bear twice the weight that broke it down, its strength must have been impaired or it would never have failed to sustain the usual weight.

It will be acknowledged before long that all iron truss framed bridges are every year impaired in tensile strength, and that their sudden fall is inevitable, especially with the heavy loaded cars now in use.

**DAMP ROOMS, DAMP BEDS, ETC.**—Damp rooms, as those in brick houses—in which the plastering is placed directly on the walls—are the fruitful sources of many of the acute or inflammatory diseases of our changeable climate. Rooms, also, seldom or never properly ventilated or sunned, in damp localities, with houses, the cellar of which is wet for any considerable part of the time, are absolutely unfit for human residences. No families can occupy such houses, living on the north side, and ordinarily escape the rheumatism and kindred diseases. It is but little less than suicide to be subjected to such continued dampness. Of course the bedding of such rooms must be not only damp, but to a certain extent mouldy, or have a musty odour—almost certain to produce colds and diseases, especially when the "spare bed" is used by those who are so unfortunate as to visit such houses. Such beds are unsafe, occupied only occasionally, even after having been thoroughly aired and supplied with fresh and dry blankets. If such localities must be occupied, it is judicious to use bedding that will absorb as little as possible of dampness and foulness—the mattress is superior in this regard to feather-beds—while almost daily airing becomes needful. Dark closets, closed trunks, bandboxes and the like, containing clothing, need often to be aired, allowing sunlight, the prince of purifiers, free access. Some free absorbent of moisture, freshly slaked lime, salt and ashes, and the like, will absorb this moisture, which may be promptly removed, at least arrying off much of the dampness. These absorb more readily and more freely than the clothes do, and will obviate a part of the evils of damp houses, and yet nothing can be an adequate substitute for the light of the sun—not even a warm fire in the room.

**THE FIRST SIGN OF CONSUMPTION.**—It is not as extensively known as it ought to be, that, in the large majority of cases, consumption begins with a slight cough in the morning on getting up. After a while it is perceived at night on going to bed; next there is an occasional "coughing spell" some time during the night; by this time there is a difficulty of breathing on any slightly unusual exercise or in ascending a hill.