to be 7¼in. instead of 9½in., they would only be three quarters as strong; yet the Bridge Co's method of calculation would show the same bending stress of 20,000 lbs. per sq. in., *i.e., it would show them to be just as safe as the original bracket.* This process could evidently be continued up to the point where the bearing stress was the limiting factor, which being viewed superficially, is absurd.

These calculations afford a striking example of the question whether a part may be stronger than the whole. Is it possible for a piece to be strengthened by the cutting away of some portion of it? The rocker under consideration would figure out to be strong enough if the longitudinal brackets were cut down to one half their length. Are we justified in saying that the casting, without any such cutting, is also strong enough? Taking the view that the smaller part is *necessarily* the weaker, one is tempted to answer "yes," but in the case in hand such reasoning is a fatal error. Simply regarded, the "stress calculation" is merely a formal computation to verify *minor features* of the design. It does not analyse or

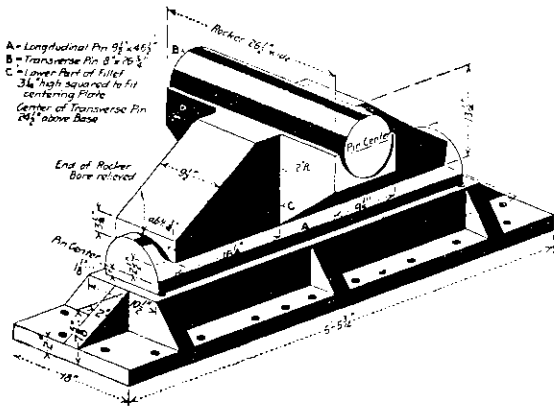

Fig. 6. Rocker and Lower Shoe.

Sheet lead ⅛ in. thick under shoe. Centreing plates bolted to sides of shoe and projecting up to fit tight against side bracket at C.

approve the design, but tacitly accepts the design as adequate and deduces a few auxiliary figures from it, and is therefore chiefly significant as being an expression of complete faith in the trained eye and sound judgment of the designer who proportioned the casting. Unfortunately, events have not justified this faith. It will be seen on reference to Fig. 4 that at D the angle fillet had been chipped away to form a bearing for the centreing plate, making this the weakest part of casting as it had to bear the highest stress. The more usual method of calculation, based on the assumption of an uniform distribution of load along the full length of pin gives a bending stress (tension) of 43,000 lbs. per sq. in. at the lower edge (only ¾ in. wide) of the longitudinal bracket.

The loss of the span, while it may appear to the lay mind to cast discredit on those responsible for the work, in reality put the remaining parts of the structure to a most extraordinary test and so proved the ability of the designers and builders. The cantilever arms deflected between 9 and 10in. under the 5,000 ton load from the suspended span; the application of the load was gradual, its release on the contrary, was sudden. Men on the ends were thrown down, while the vibration lasted long enough for one man to run about 250 ft. toward the anchorage. The known details as to the successive steps in the plunge show that very large overloads must have been borne by the down-stream truss on the south cantilever, and the upstream truss of the north cantilever. Yet the cantilevers stood; and now stand as a silent tribute to the marvellous precision and finish of the shopwork, the ingenious and highly successful erection methods, and to the splendid ability of the responsible engineers.

The latest failure can only delay for a short time the completion of the bridge. The suspended span is, after all, of moderate proportions compared with the gigantic cantilevers with which it will connect; and it will not be long before the successful placing of a new suspended span will be recorded.

For many of the details, and five of the illustrations we are indebted to the "Engineering News" and "Engineering Record."

The Young Architect

The great mistake made by the young architect at the beginning of his career is usually his failure to recognise that the world in which he lives is not supremely interested in architecture written with a capital letter, and has not the time or inclination to make a close and intimate examination of the architect's qualifications.

On the other hand, everyone enjoys pleasant and congenial companionship in daily life, and the architect who has lived a self-centred life of absorption in one pursuit is frequently a dull or boring companion in society. His natural anxiety as to his own future will, unless he is careful, operate directly against his chances of success, and when he obtains work he should remember that it is more to his advantage to have converted a client into a friend than to have pleased himself with the design of a building which, in any case, he will regard as a tentative effort in the future.

We do not mean that he should be as wax in the hands of his client, or fail to do his utmost to produce good work, but he should avoid the mistake of overestimating the importance of what he is doing. Anxiety is an enemy to success, for the anxious man is one who spoils his own mental freshness and force in dealing with the affairs before his notice, and he will recognise that he can neither anticipate fate nor see clearly what it may bring him in the future.

The greater the number of interests he has outside his own work the greater will be his chance of making friends, and on his capacity to do so will depend in a large measure his future success.—"*The Builder.*"