

GERMANY'S HIGHEST BRIDGE.

Three hundred and fifty-one feet above the water by railroad! That is about the height of two church steeples placed one on top of the other. When the Prussian Landtag granted the right to build the Solingen-Remscheid road—a very important connecting road, not only for the iron and steel industry of the mountains, but also for passenger traffic—the foundation was laid, so to speak, for the construction of the most interesting and remarkable railroad in the monarchy.

If we start out from Solingen on this road, which is now in course of construction, a changing picture is presented to the eye. The natural difficulties have been overcome by means of a serpentine track, high embankments and deep cuts. The first viaduct, which still shows a confusion of scaffolding beams, will be 131 feet high. Our progress is suddenly stopped. Before us lies a deep valley. If we look straight across to the mountain on the other side, we discern a little fluttering flag, scarcely visible to the eye from this point. It indicates the course that will be followed by the iron horse. This is the place where the valley will be bridged over by an iron viaduct 1,640 feet long and 351 feet high.

Our engraving shows this great structure, which,

Dumb Waiter Shafts.

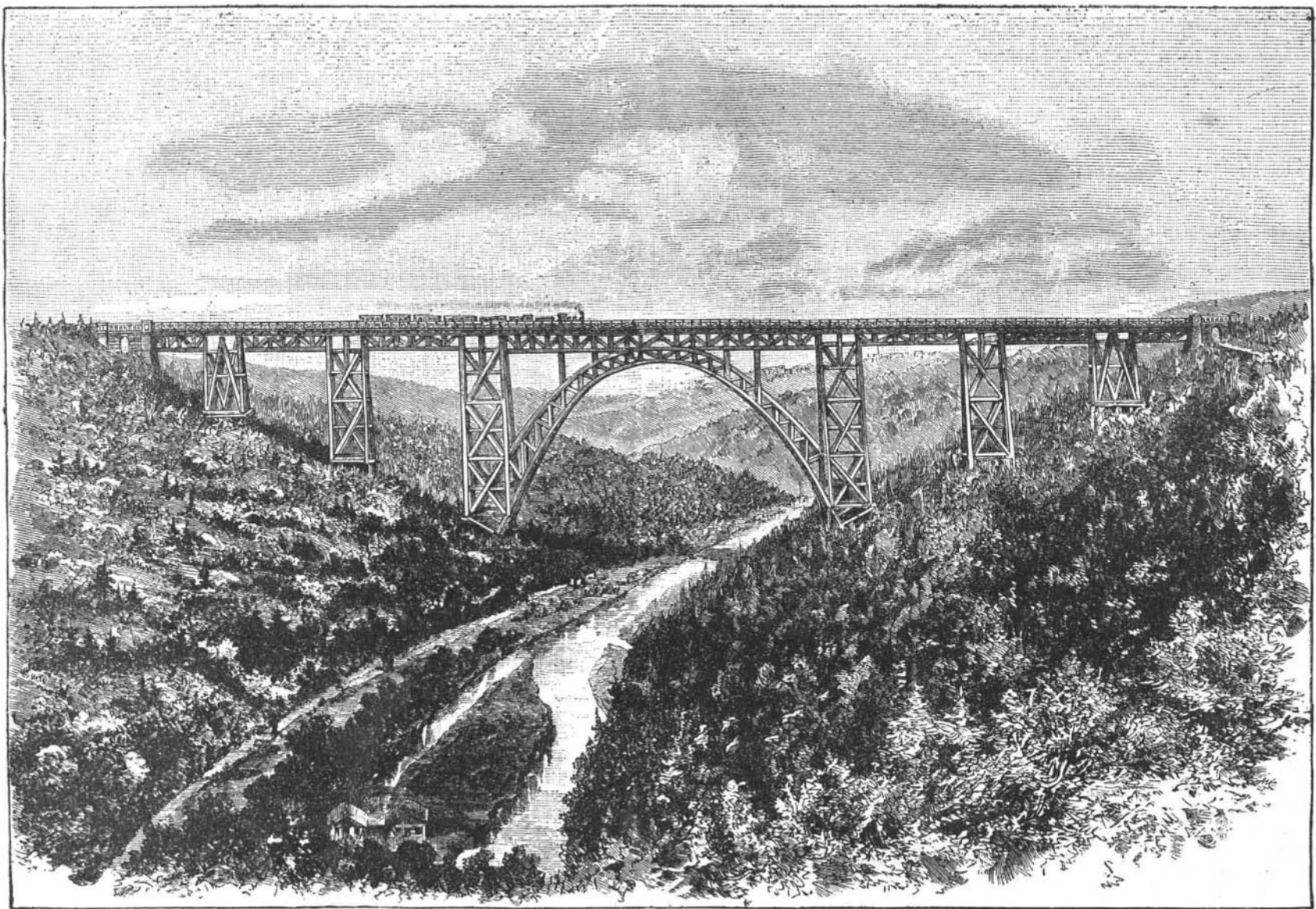
A correspondent asks the editor of the *Real Estate Record and Guide*, of this city, "for information as to how dumb waiter shafts should be constructed. My understanding of the law is that all such shafts which extend through more than three stories must be inclosed with walls of brick or with a suitable framework of iron filled in with burned clay or other fire-proof material, carried three feet above the roof and covered with a metal skylight, and that the openings must be provided with fire-proof doors. I know of five-story and cellar flat houses, recently built, in which the dumb waiter shafts on three of their four sides are constructed of wooden studs filled in between with burned clay tiles, this construction extending from the cellar floor to the extreme skylight top above the roof, and the doors in same on the several stories are of unprotected wood. The shafts are plastered inside and outside, and above the roof line are covered on the outside with sheet iron. If the method described is lawful or is allowed by the Department of Buildings, then many of us have been building better than required."

The law governing the construction of dumb waiter shafts is stated quite correctly in the above letter. It seems almost incredible, the editor adds, that any

sions in the building law is the requirement that elevator and dumb waiter shafts shall be fire-proof. In case of fire in the lowest story the shaft acts as a great flue to carry off the hot and blinding smoke and flames past the upper stories and out through the thinglass of the skylight into the open air, thus giving the inmates of the burning building a better chance to escape and the firemen a better chance to extinguish the conflagration. If the shaft be constructed with wood studs and something else, the intense heat quickly peels off the plaster, and in a very few minutes there are lines of blazing wood from the cellar to the roof communicating with every floor, and the whole building is doomed. The proper construction of shafts for dumb waiters and elevators and shafts for light and ventilation is deemed very important by underwriters, and we doubt whether any insurance company would take or continue a risk at any price on a building where it was known that the shafts are built in violation of law.

Cement for Steam Packing.

Portland cement is mixed with sufficient water to form a stiff paste, so that when applied to a wall it will not fall off or run. This cement may be used for manhole lids with excellent results. It is applied to



THE HIGHEST BRIDGE IN GERMANY ON THE SOLINGEN-REMSCHIED R.R., NOW BEING BUILT.—FROM PLANS DRAWN BY ARTHUR RIEMER.

when completed, will be a brilliant proof of the high attainment of German technic. A span 558 feet long, with a gigantic elliptical arch, forms the bridge proper, and at each side there is a number of strong pillars which are connected with one another by iron work. All of the iron work together will weigh 4,100 tons. The end supports, each of which is arched to form a passage for a road and the single supports, all of which are founded on solid rock, comprise 13,080 cubic yards of masonry. The cost of constructing the double track viaduct is estimated at about \$535,500. The work has been begun, but will not be completed for two years. The preparatory work is very extensive. It will be necessary to build first a temporary bridge 98 feet high. The material will be transported by means of a wire rope road, and the separate parts will be raised, by means of hoisting apparatus operated by electricity, to the dizzy height where they will be mounted. So much for the bridge.

Keeping the goal of our wandering in view, we follow the line through deep valleys and over high hills, and finally we pass, mentally, through a steep, curved tunnel, which brings us to the end of the road, at Remscheid, a town noted for its iron and steel industry. The road is only seven miles long.—*Illustrirte Zeitung*.

one should construct a dumb waiter shaft, extending through six stories, with wood studs instead of an iron framework, and with unprotected wood doors instead of fire-proof doors. The consequences that might follow ought to deter an architect from specifying or a builder from executing work that is in so gross violation of law. The expense of removing the unlawful construction and replacing it with what is lawful, costly though it would be, might prove to be the least of the troubles for the wrong-doers, when detection comes. In case of loss of life from fire in the building, an official investigation would locate the responsibility, and the person or persons guilty of the violation of law, or having allowed a violation, would be punished by imprisonment, and this would be more serious than the payment of a penalty or the cost of replacing the shaft, as the building law provides. Included in that responsibility for the loss of life would be the builder or owner, the district inspector of buildings and the architect. The lessons of the past are sufficient to teach builders that it does not pay to violate the building law; that it is better, in good faith, to carry out every requirement rather than to evade any requirement. It doesn't pay to do wrong in any business, least of all in a builder's. One of the most important of the provi-

the carefully cleaned surfaces in a layer of from 5 to 8 mm. in thickness. As soon as the cement is applied the lid is carefully put upon it and slowly tightened until the thickness of the layer is reduced to from 3 to 4 mm. After an interval of several hours the cement begins to set, and now the nuts on the lid are firmly screwed down. During the next eight hours the joint is kept slightly moist, so as to prevent hair cracks. A manhole packed in this manner never becomes loose. In a similar manner flange joints on water, steam, or air pipes may be tightened by means of cement. Such joints, if carefully prepared, prove exceedingly durable, and are much cheaper than India rubber or asbestos packings.

Cleaning of Street Car Rails.

In a paper recently read before the English Society of Engineers, by Mr. H. Conradi, he said that the tractional resistance between clean and dirty rails varied as much as 30 lb. Cleaning by hand once a day costs 25 cents per mile of single line, in fine seasons, and twice as much in bad weather. Watering by cart twice a day costs 60 cents per mile. Cleaning by a special device successfully used on the tram cars of Reading, England, for the last eighteen months, costs 12 cents per day, and even less.