Editorial

TRACKAGE REQUIREMENTS OF INDUSTRIAL ENTERPRISES.

One of the chief problems in connection with factory construction is trackage. We are disposed to term it a "chief" problem for the reason that in designing a layout for factory and industrial enterprises it often happens that neither the architect, engineer nor owner gives the matter of trackage much thought. He relies on the supposition that after the land has been acquired and the building erected the tracks can be run into it without trouble. This is a serious oversight, as an important factor in the success of an industry is the quick and economical handling of the raw material to the factory and of the finished product away from it.

As Mr. G. H. Herrold, C.E., of the Civil Engineers' Society of St. Paul, remarked when discussing Mr. King's paper, appearing, in part, in this issue: "A first-class factory poorly erected with reference to trackage, resulting in awkward switching facilities, is only half a factory."

In designing such trackage, it is necessary for the engineer to be familiar with the daily car requirements of the establishment and also with railway switching methods in general and the particular switching services to be obtained at this point. It is sometimes stated that designers of factories have little conception of permissible grades or curvature for practical switching. This often results in requiring additional land for right-of-way, and a track longer than necessary. Sometimes it also requires the building of trestle work or the making of excessive fills in order to bring the track to the factory at the proper level and give a length of track along the factory, which should be level to permit the hand-shifting of cars, if necessary, during the day.

That the tracking problem is not given some attention by our designing engineers of factories is, of course, generally untrue. Nevertheless, it forms a vital part of factory equipment and constitutes requirements to suit the individual case. The simplest track possible is one switch and a stub track running along the factory, which may serve the purpose for small outputs, although a double-end track is more desirable, as it facilitates better handling of the cars. If the nature of the industry is such as to require a different class of cars for the finished product than for the raw material, arrangements should be such that empties and loads can be placed at the factory doors in the morning in the order required and the loads and empties removed from the other end of the track in the afternoon without disturbing any cars not yet unloaded or being loaded. If the business of the factory is sufficient to require two or more tracks, one should run at each side of the factory, one for raw material loads only and the other for loading and outgoing loads only. This is in line with the general tendency of factory design to begin its processes at one side of the factory and deliver the finished product on the other side, eliminating cross-handling as much as possible.

Referring to the remarks of Mr. Herrold, the economical design of factory buildings involves the following problems in approximately the order given:

A study of the processes to be carried on in the factory.

The design or selection of the machinery.

The layout of the machinery and determination of floor space.

The layout of yard room.

The determination of the daily car requirements.

The investigation of switching service in the locality selected for location.

The design of the track layout desired.

The fitting of buildings and tracks to the ground owned or available by actual surveys.

The general revision of all plans to compromise with conditions.

LONG CONCRETE ARCHES.

In the progressive march of science and engineering there occurs, at intervals that possess a semblance of periodicity, epoch-making events whereby the veil of familiarity is lifted to display before the world some superlative achievement, surpassing all others existent in its class, but almost inevitably destined to experience, some day, the event of being itself similarly surpassed. The literature of the engineering profession makes frequent reference to some new enterprise which is, for a brief period of time, "the largest in existence." Bridges, tunnels, dams, ocean liners, sky-scrapers, canals, hydro-electric power developments, etc., have all at one time or another taken advantage of our susceptibility to regard them, unthinkingly, as the last word in their particular line of engineering enterprise. The frequency of such occurrences, however, has come to be a mark of engineering activity throughout the world.

The design and construction of reinforced concrete bridges serve as an illustrative example of this progress. Since the beginning of the 20th century there have been a dozen or more occasions to refer to some new and surpassing construction throughout the various countries.

In *The Canadian Engineer* for June 27th, 1912, an article was published describing the Ponte del Risorgimento, which, with its arch span of 328 ft. in a 33-ft. rise has for several years maintained its distinction as being the largest reinforced concrete arch in the world. It was built in 1911 over the Tiber in Rome, and its design was noteworthy in that at its crown the thickness of the arch is only 8 in., increasing to 20 in. at the springing lines. Stiffening ribs, 8 in. in thickness, extend throughout its entire length.

This bridge over the Tiber has resigned its distinctive greatness to an arch which is now being constructed at Langwiez, Switzerland, and which has a 330-ft. span. This bridge, however, unlike its predecessor in design, is of massive construction, with a rise of nearly one-half of its length.

The Ponte del Risorgimento, noted above, had taken the title from the Grafton bridge in Auckland, New Zealand. This was a reinforced concrete structure with a 320-ft. span and a rise of 86 ft. begun in 1907 and completed in 1910. The Munro Street bridge in Spokane, Wash., also of concrete, had a span of 285 ft. and a rise of 117 ft. For a list of long concrete arches giving dates of erection, principle dimensions, etc., the reader is referred to *The Canadian Engineer*, Vol. 22, No. 26, page 843.