to span a river on which there is steam boat traffic, it then becomes necessary to supply a bridge which will either turn around or lift up, to allow for the passage of vessels.

The ordinary swing bridge is so common on both highway and railway work that I do not think it is necessary to dwell upon it here except to say that in order to have a swing bridge it is generally necessary to have a waterway of sufficient width to allow for a special pier, to support the bridge being built, in mid-stream. Swing Bridges are made of either plate girders or trusses according to the length of the span. If the waterway is too narrow to allow for the use of a swing bridge, some type of lift bridge, of which there are several kinds, is used.

The Vertical Lift is similar to a fixed bridge except that at each end, built on the masonry, is a tower containing operating machinery which raises the bridge in its horizontal position to the required height, thereby allowing boats to pass directly underneath. This type of bridge is very seldom used. The other style of lift bridges are so designed as to allow one end only to be raised. The two most common types are known as the Trunnion Bascule Bridge and the Rolling Lift Bridge.

TRUNNION BASCULE BRIDGE

As in fixed bridges so there are a number of styles of Bascule Bridges. To give a description of each style would take up altogether too much of your time, and as the general principles are the same, I think it will be sufficient for me to give you a general description of the largest double decked, double tracked trunnion bascule bridge in the world. This bridge was built for the Canadian Pacific Railway Company and spans the Kaministiquia River at Fort William, Ontario. The design was prepared by and the bridge was fabricated under the supervision of the Strauss Bascule Bridge Co., of Chicago, Ill. It is known as a 186 foot single leaf, double decked, double tracked, electrically operated Strauss Trunnion Bascule Bridge. The design is a combination of a deck and through truss span, two railway tracks occupying the lower floor and two street car tracks and a highway occupying the deck or upper floor. There are steel trestles or approaches leading to and from the upper deck. On one shore are two steel towers 40 feet wide. These towers support two trusses known as the counterweight trusses. These trusses act in a similar manner to the beam of a set of scales, for on one side are two massive reinforced concrete counterweights, while on the other side is the span proper, which crosses the river. The total length of the bridge is 274 feet. The two trusses which are about 37 feet high are spaced 33 feet centre to centre. The distance from the masonry to the top of the