ARCH BRIDGES.

LXIX. An arch bridge may be distinguished from an Arch Truss Bridge, by the fact that in the former, the bridge and its load are sustained by one or more arches without chords; and, consequently, requiring external means to withstand the horizontal thrust or action of the arches at either end; which means are afforded by heavy abutments and piers, in case of erect arches, and by towers and anchorage in the earth, in case of inverted, or suspension arches.

It is not the purpose of this work to treat elaborately of either of these forms of bridging, as the author's experience and investigations have been mostly confined to truss bridge construction. But as some of the largest bridge enterprises and achievements of the age are designed upon the principles here referred to, a brief notice of the subject, and some of the conditions affecting the use of these classes of bridges, may be regarded as desirable in a work of this kind.

Suspension, or inverted arch bridges of very great spans, have long been in use, both in this and foreign countries; and the capabilities of that system have been pretty thoroughly tested experimentally and practically.

But bridges supported by erect metallic arches, have hitherto been confined to structures of moderate span. Within a few years, however, the magnificent enterprise of spanning the Mississippi at St. Louis by three noble stretches of about 500 feet each, supported each by four arched ribs of cast steel, has been undertaken and is understood to be in rapid process of execution.

The interest naturally felt in the progress and final result of this grand enterprise, by students and practi-