Largest Arch Bridge in the World

Over 50,000 Tons of Steel to Span Sydney Harbour

AST month we related how the pro-posals for the Sydney Har-Bridge gradually developed into a definite scheme, and we described the bridge in detail. This month we deal with the problems involved in its construction of the difficulties with which bridgebuilders have to contend.

The erection of any bridge and especially of such a huge

A composite drawing showing aerial view of the bridge as it will appear when completed

structure as that which is to span Sydney Harbour—calls for the highest skill and engineering knowledge. Nothing can be left to chance, for the loss of hundreds of lives and of vast sums of public money might be the result

of the slightest error in calculation. For therefore, work has been going on, on paper, in respect of this bridge, and calculations of strains and stresses, of the resistance of metals, and a hundred and one other things. Every small part has been fitted into position in theory. The place of every rivet and every bolt has been determined, and a legion of draughtsmen have been and still are at work on the detailed plansthe "blue-prints" of the engineering world.

Not the least of the many problems upon to resist enormous strains and stresses. Apart from its own tremendous weight of more than 50,300 tons, it will have to withstand the constant force of the wind and in a gale of hurricane violence the strain from this cause alone

will be terrific. Quite apart from such outside causes as this. a tremendous strain will be imposed by the ordinary day's work of the bridge. The structure is designed to carry 160 trains, 6,000 vehicles and 40,000 foot passengers per hour and it is calculated that with a full load the deflection at the centre of the bridge will be $4\frac{1}{2}$ inches.

confront

the builder of

bridges is the

strength of his materials. A

faulty girder or

a badly cast

truss may spell

disaster or at

least the ruin

of many months of work, and

consequently

the most rigor-

ous tests are

applied, in a

manner that

will be de-

scribed shortly.

The Sydney

Harbour Bridge

will be called

Enormous

Strains and Stresses

The greatest pressure that each of the steel bearings—there will be two at each end—will have to carry will be 40,190,000 lb. Of this tremendous stress 73 per cent. will be due to the



This photograph shows the progress made on the southern approach