

SCIENTIFIC AMERICAN

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A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. LVIII.—No. 20.
[NEW SERIES.]

NEW YORK, MAY 19, 1888.

[\$3.00 per Year.]

NOVEL TYPE OF HIGH SPAN BRIDGE.

Owing to the enormous expense of acquiring real estate for the construction of the approaches and termini of bridges in populous districts, a most interesting engineering problem is presented in the designing of bridges in which this difficulty is to be avoided. The bridge illustrated in the accompanying engraving is of this type, the shores being little above the water level, the stream being a navigable one, and the necessary condition being that the span should be sufficient to allow several ships to pass under simultaneously, and of sufficient height to permit vessels of ordinary size to pass under without the necessity of opening the draw. This bridge was intended to be erected across a wide canal running through Amsterdam, Holland, and engravings were prepared from the original designs of Mr. E. Haverkamp, C.E. The conditions which governed the building of a bridge of this description were as follows:

The city of Amsterdam, Holland, is built in the form of a half circle, the center of which is situated near the central railway depot, its diameter being the North Sea canal. The population of this city, now about 400,000 souls, is continually increasing and consequently also its number of houses and streets. Some of the latter ones are already extending the boundaries of the city, which makes it desirable that new buildings should be erected on the other side of the canal, where the lots form a direct part of the township of Amsterdam.

But the citizens object to build on that part of the canal, on account of its limited means of communication with the city itself. The people, in starting from that part, are compelled to make use of a ferry-boat, on the De Ruyterkade; and although other cities intend to build tramways, northward of Amsterdam, to connect with that city by cars propelled by steam, it is beyond question that even then it will take much longer time to cross the canal than by means of a bridge.

This lack of accommodation gave Mr. Gerard W. Schimmel, a learned jurist of that city, and a gentleman of superior intellectual faculties, the impulse to

submit to his countrymen a plan of a construction of a bridge crossing the canal, which was formerly called "Y." It is true similar plans have been projected before by others, but none was found practicable, on account of the enormous expenses connected with their erection and the difficulties they would cause to the navigation of vessels, so that these projects were never considered by the authorities of the city of Amsterdam.

Mr. Schimmel, however, has in his plan, which was calculated and drawn by Mr. Haverkamp, provided for these defects, and proved that by following his mode of construction, the city will be able to obtain a bridge of a height amply allowing steamers and vessels of small dimensions to pass under it and only to open this bridge for the passage of larger steamships.

On a first view of Mr. Schimmel's project, it would be supposed that in order to obtain this result, it would be well to provide the bridge with entrances equal to those of the Brooklyn bridge, but that would be impossible by the lack of sufficient space at the aforesaid De Ruyterkade. Therefore Mr. Schimmel in planning his project was compelled to follow another system.

The bridge is projected for the use of carriages, street cars, and passengers. The width of the road, not including the tramway, is 32' 6". That seems to be too much, but now we have the great advantage that near the foot of the tower there is no width less than 19' 8", so that two carriages can pass each other without touching the rails. The gauge of the tracks is 4' 7½", and equal to that of the Amsterdam street car company. The tracks on the swing bridge are traced symmetrical with respect to its axis, so that the bridge can always be turned in the same direction.

DIMENSIONS OF THE ROADS.

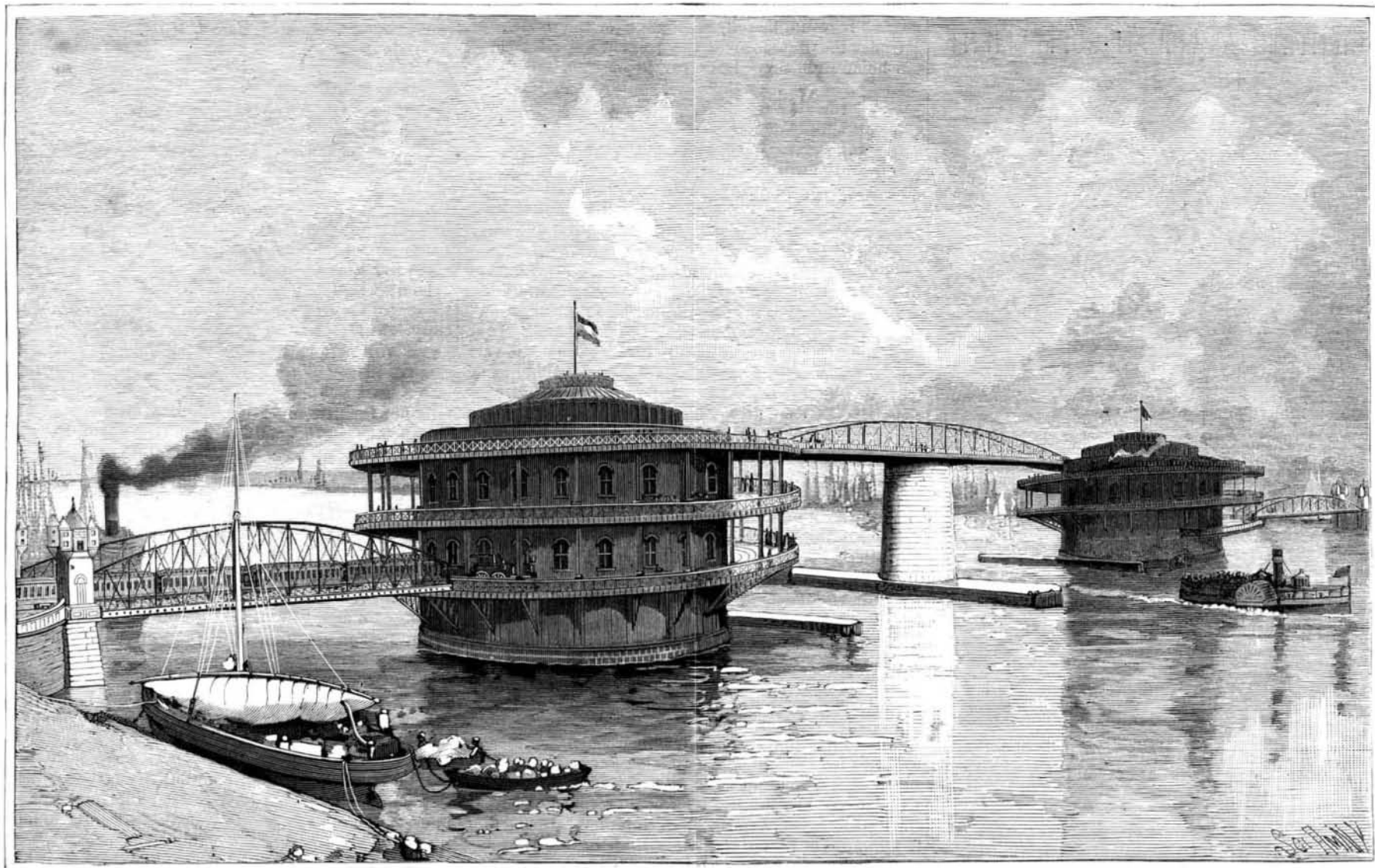
Part of the bridge.	Sidewalks.		Road.	Tramcar.	Total.
	Number.	Width.			
Approach	2	8' 1"	32' 6"	16' 3"	64' 11"
Gallery	1	8' 1"	19' 8"	16' 3"	52' 1"
Swing bridge.....	2	8' 1"	19' 8"	16' 3"	44"

Both approaches have a length of 196' 8" between the centers of bearing, with a grade of 1:40. The distance between the lower part of the main girder and the water surface is, on an average, 13'. Near the towers they are supported by means of consoles, going through the center of the tower, having a length of 177', and near the wall of the tower a height of 14' 7½". Those consoles are supposed to be constructed of wrought iron tubes, three for each console, strongly connected with each other. The clear opening of the turn bridge is 91'. This is sufficient, because the new lock at Yminder, the sea end of the canal, will get a width of 81' 3". The bridge is supposed to be opened with hydraulic machines, placed in the center pier. The distance between the lower part of the main girder of the swing bridge and the water surface is 48' 9". The towers have an outward diameter of 143', and are constructed of stone. In the walls are windows to lighten the interior. The inner part can be used for making offices, lifts, and, when necessary, a footpath with a grade of 1:50. After having turned once round the tower, we have mounted 13' 9". This number could be easily increased, without changing the grade, but then the diameter of the tower would grow too large and the latter take too much space in the canal. As a matter of fact, the grade of the floor round the tower is not everywhere the same, as is shown below:

Part of the way round the tower.	Traffic.	
	Up.	Down.
Street car.....	1:38.2	1:34.4
Roadway.....	1:46.6	1:42.1
Sidewalk.....	1:53.3	1:53.3

The upper part of the tower is covered with a roof, under which are the entrance to the lift, the waiting rooms, and the other accessories.

THE oldest arm chair in the world is the throne of Queen Hatafu, who flourished in Egypt 1,600 years B.C. It is of ebony, beautifully carved. It is now one of the treasures of the British Museum.



NOVEL METHOD OF CONSTRUCTING A HIGH SPAN BRIDGE WITH LOW TERMINI.