

ENGINEERING

Hudson River Bridge Rivalled For Fame by New Arches

As Hudson Structure is Greatest Suspension Span, So Kill Van Kull and Sydney Bridges Exceed Other Arches

WHILE the completion of the great George Washington suspension bridge, which has hurled itself in one bold leap across 3,500 feet of the Hudson river from Manhattan to the New Jersey shore, is being celebrated, two other bridges, likewise the largest in the world of their kind, are being given finishing touches preparatory to their christening in the mighty stream of modern traffic.

They are twin bridges, or nearly so, for one is only two feet and one inch longer than the other; and they are built after exactly the same type of construction. They are steel arch structures that exceed their greatest predecessors even as the bridge across the Hudson surpasses the next mightiest suspension span.

These two structures are the Kill Van Kull steel arch bridge connecting Staten Island, a borough of New York City, with the mainland of New Jersey; and the Sydney harbor bridge in distant Australia.

Almost Twice as Long

The George Washington bridge has a span not quite twice as long as that of its nearest rival, the Detroit-Windsor Ambassador bridge, which was dedicated scarcely two years ago. The two new steel arch structures likewise leap far greater distances than those covered by the famous Hell Gate bridge in New York, which has maintained its lead since it was opened in 1917. The length of span between centers of end pins of the Kill Van Kull bridge is 1,652 feet and one inch, of the Sydney harbor bridge 1,650 feet, and of the Hell Gate bridge only 977 feet and six inches.

While a steel arch may lack the delicate swinging lines of suspended cables and may not cover the superlative distances necessary to excite popular imagination, its curve must be mathematically true so that its load will not put a few girders under dangerous stress and it must be erected with the linear accuracy of one part in thousands, if millions of dollars spent for materials and the work

of technical brains for years are not to be wasted.

Inaccuracy was not a fault of either of the twin bridges. The most dramatic moment during their construction proved that. This incident was the pinning together at the keystone of the arch of the two arms which had been erected out and up into space until they met more than 300 feet above the water and over 800 feet from land.

The engineers' aim at the center of the arch was accurate to one-half an inch for the Kill Van Kull bridge and to about one inch for the Sydney structure. And this was close enough. A few minor adjustments of temporary cables and jacks supporting the arms of the arch made the fit exact.

Although statistics on the American arch, which is slightly the larger of the two, are not as imposing as those for the George Washington bridge across the Hudson; they do describe a much-needed link in New York's transportation scheme, for the Kill Van Kull bridge is the final link in joining by highway New York's most populous borough, bustling Manhattan, with the least populous—spacious, residential Staten Island.

The bridge is being finished at a cost of about \$16,000,000 with a four-lane

vehicular roadway 40 feet wide between curbs and with one footpath. Later the roadway can be widened to accommodate three more lanes of traffic or two rapid transit tracks. The arch has a rise of 274 feet from the center line of the bearings to the center of the lower chord. Under the middle of the bridge there is a clearance of 150 feet above mean high water, while for a distance of 1,000 feet across the channel, the clearance is 135 feet.

To this structure the Australian bridge has the likeness of an identical twin with the exception of a slight inclination to be short and stout. In addition to its two-foot one-inch difference in length, the bridge provides a wider roadway than (*Please turn page*)

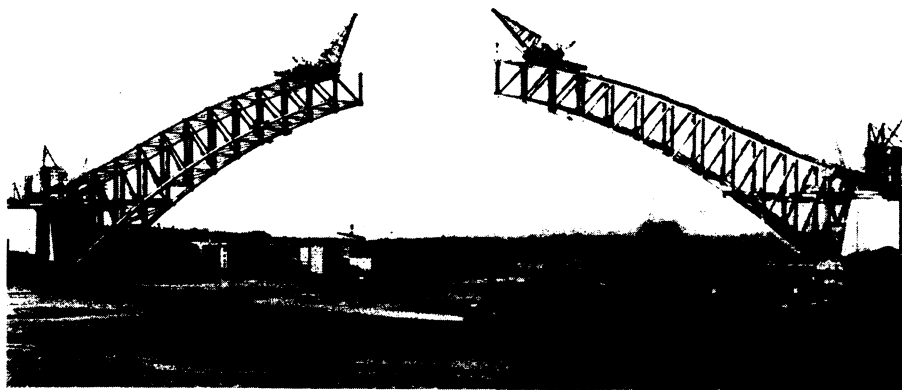
ASTRONOMY

Nagata Rewarded For Discovery of Comet

MASANI NAGATA, melon-patch worker and amateur astronomer, has been rewarded for discovering a comet which caused his name to be spoken throughout the scientific world. The Japanese melon-farm foreman has been awarded the Donohoe comet medal by the Astronomical Society of the Pacific for his discovery last July, Alfred H. Joy, president, has announced.

The unexpected discovery was observed on the night of July 16. Nagata was making his customary observations with a three-inch telescope when the comet crossed his line of vision. Confirmation was sought and received from the Mt. Wilson Observatory. This showed that Nagata had observed the first new comet of 1931.

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AIMED AT THE "KEystone"

That is what might have been said of the Sydney Harbor arch bridge at this period of its construction when its two halves were leaning precariously out into space, feeling for each other. The twin to the Sydney structure is the Kill Van Kull bridge, near New York City.