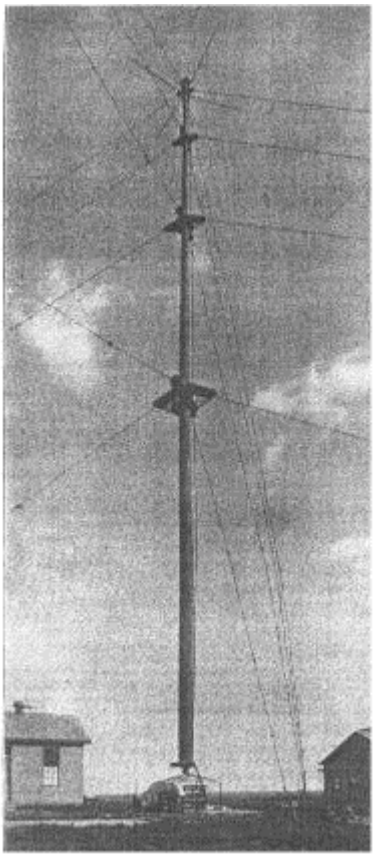
The Day That the Mast Came Down by Donald Kelly

Disaster struck Machrihanish at one o'clock on the afternoon of Wednesday, December 5, 1906. By mid-day, the mast was visibly swaying backwards and forwards and then, without warning, one of the stays on the west side of the mast gave way. There was a loud 'double report' and the mast collapsed, the lowest 100-foot section falling first and forwards to the north and then the remaining 320-foot upper section crashing backwards to the south.



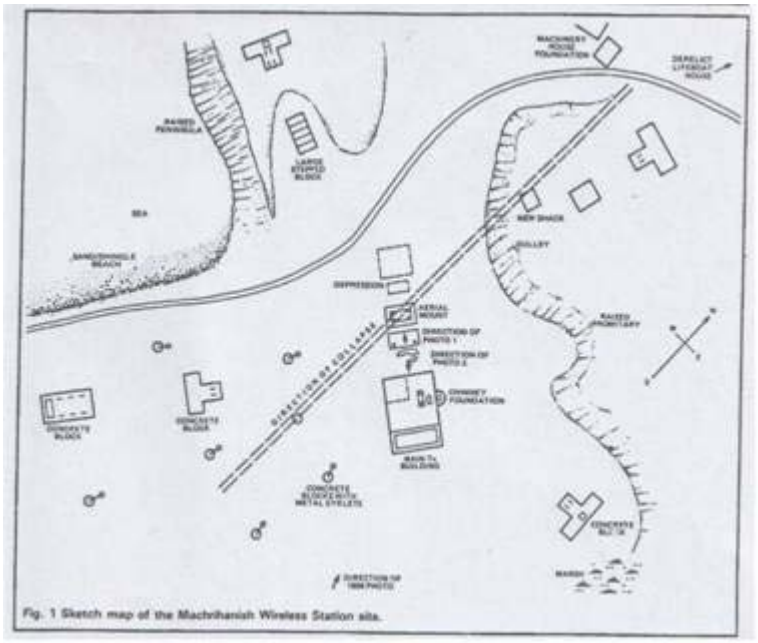


Fig. 1 Sketch map of the Machrihanish Wireless Station site.

In 1904, Reginald Aubrey Fessenden (1866-1932) and The National Electric Signalling Company decided to erect two transmitter-receiver radio stations for trans-Atlantic broadcasting trials.

The sites selected were Brant Rock, 30 miles south of Boston, Massachusetts, U.S.A. and Machrihanish. These two points were selected because the great circle joining them passes up the Bay of Fundy, over the Isthmus of Chignecto and across Newfoundland.

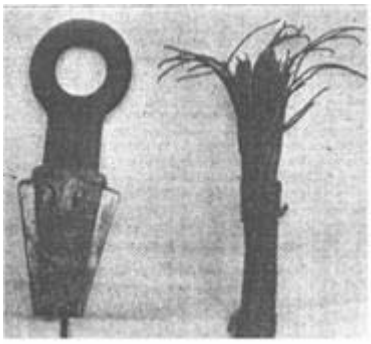
The contract for the steelwork and erection of these towers was let to the Brown Hoisting Machinery Company, of Cleveland, Ohio, U.S.A. and, for the insulators to the Locke Insulator Company, of Victor, N.Y., U.S.A. Owing to delays on the part of the contractors, the towers were not completed until December 28, 1905.

On Friday, December 29, 1905, Brant Rock sent to Machrihanish, but nothing was received, owing, as it was afterwards learned, to a miscalculation in the transmission

wave-length. On January 2, 1906, Brant Rock sent again and Machrihanish received the messages. Communication was maintained one way until about the middle of January when it became evident that the stations, not yet sufficiently powerful for commercial work, were shut down for reconstruction and, owing to the difficulties of getting aluminium for the compressed-air condensers, the stations were not opened again until October, 1906.

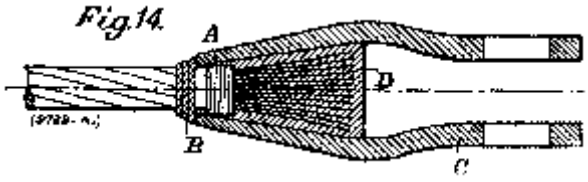
The stations then, barring shut-downs for a couple of nights for mechanical reasons, operated continuously until the afternoon of Wednesday, December 5, 1906 when the tower at Machrihanish blew down in an Atlantic gale, luckily without any casualties.

Six weeks later, the January 18, 1907 edition of '*Engineering*' (magazine) published an illustrated technical report of the incident to alert others in the construction industry about the contributory causes of the mast's collapse.

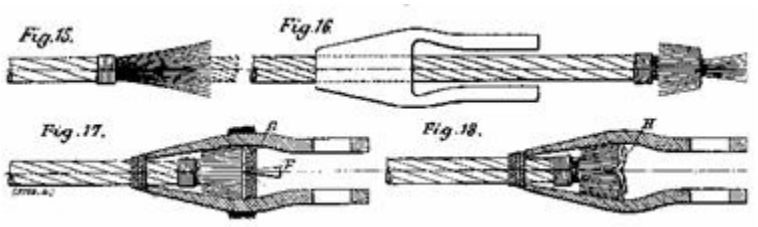


The failed guy-rope joint

It had been intended to use 'Crosby, clamps to fasten the wire ropes to the steel shackles but, the engineers of The Brown Hoisting Machinery Company however pointed out that the method used by Roebling had proved very satisfactory in the case of the Brooklyn Bridge and this then became the method that was adopted for the Machrihanish mast.



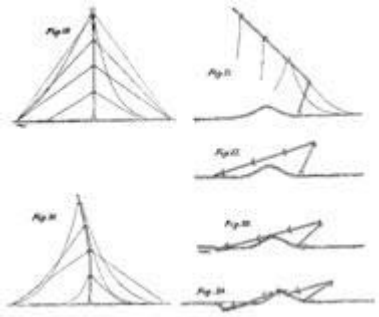
Roebling's method is shown in here, in Fig. 14 - A piece of binding wire 'A' is put around the cable and each strand of the end of the cable unlayed so that no two wires are twisted together. The unstranded end of the cable, which is of galvanised wire, was then dipped in dilute hydrochloric acid, the wires then bunched together and pushed into the socket 'C'. A wire is wrapped around the cable at 'B', the socket 'C' then poured full of zinc, 'D' and the socket washed with water. Despite some fears about some corrosion from the hydrochloric acid, a careful examination of sockets poured nearly two years earlier showed that absolutely no corrosion had taken place. But, investigation showed that the Brown Hoisting Machinery Company had adopted a different method of making these joints from that above described.



Brown's method, shown in. Figs. 15, 16 and 17, above, had, in Fig 15, the end of the cable is shown stranded. In Fig. 16 a portion of the end is turned back and, in Fig. 17, a wedge 'F' is driven into the stranded end of the cable with melted zinc is poured into the space 'G'. The joint which gave way and caused the destruction of the tower is shown in the photograph and in Fig. 18, here, where the wedge, 'H', split and was simply pounded flat. The wedge then, instead of being withdrawn and a new wedge inserted, as should have been done, prevented the melted zinc from flowing into the socket and, as to add to things, the poured zinc being too cold, the rope was merely held in the socket by the friction between the rope and the socket.

Further enquiries found that that a considerable number of joints made by the workman above referred to had been poured too cold and it is a wonder that the tower did not fall before.

The guy attached at the 400-ft. level went first, the 300-ft. guy succeeded it and so on. After the 400-ft stay had gone, the top of the tower leaned over under the tension of the opposite stay and threw more stress on the remaining cables, until the tower collapsed at about a quarter of its height from the ground, the sequence shown here.



Bravely, the site manager, a Mr H. J. Glaubitz, announced that the mast would be rebuilt but, within weeks, the staff had left and the station site demolished soon afterwards.

Six days after the mast's collapse, Fessenden decided to make *The World's first ever advertised broadcast of speech and music,* on Christmas Eve, 1906. At 9 p.m. that night, Fessenden gave a short speech about the programme to follow. The Edison phonograph squeaked out a solo voice singing Handel's *'Largo'* and then Fessenden picked up his violin and played his own version of Gounod's *'O Holy Night'*, even managing to sing the last verse as he played ! Fessenden then read a passage from The Bible, wished his listeners *'A Merry Christmas'* and announced that he would give another programme on New Year's Eve, that broadcast reported heard as far south as Guantanamo Bay in Cuba.

Fessenden's company, *FESCO* - The National Electric Signalling Company, was badly mismanaged and by 1910 it had collapsed in dispute and acrimony, the 420-foot high mast at Brant Rock being dismantled in 1917.

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