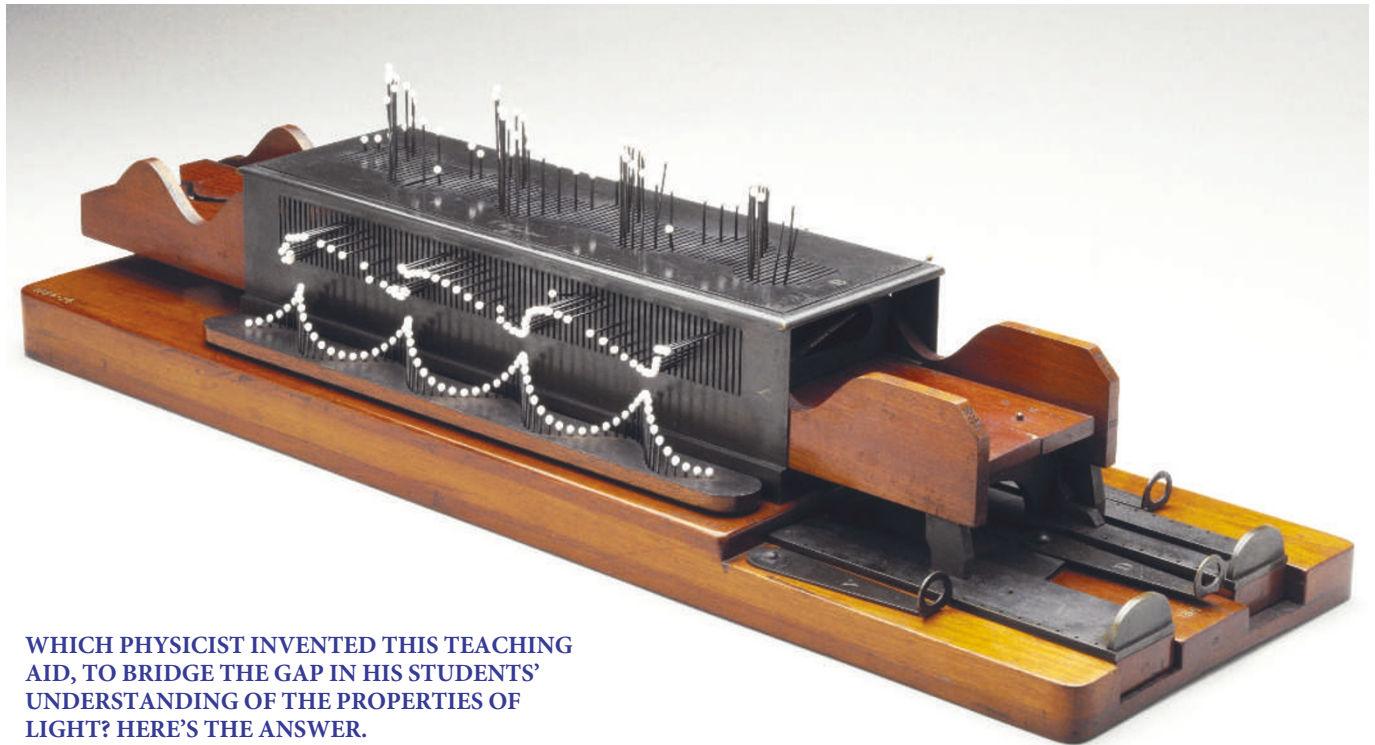


Final answer

Here is the solution to last month's image, which marks the end of our series featuring apparatus of historical interest from London's Science Museum.



WHICH PHYSICIST INVENTED THIS TEACHING AID, TO BRIDGE THE GAP IN HIS STUDENTS' UNDERSTANDING OF THE PROPERTIES OF LIGHT? HERE'S THE ANSWER.

Charles Wheatstone was appointed professor of experimental physics at the newly founded King's College, London, in 1834. He had a career as a musical instrument maker and experimenter in acoustics behind him, and had invented numerous devices including the kaleidophone, polar clock, reflecting stereoscope and telegraph. He was interested in wave motion, both in sound and light, but believed that the complex concepts behind polarization, in particular, were very difficult to understand without clear demonstration. Hence he developed his wave machine, in about 1842, to make such concepts clearer. It has been estimated that he made — or, more precisely, had made — about

thirty machines, some of which survive in the USA.

The transverse-wave theory of light gained acceptance during the 1820s and 30s, following the work of August Fresnel. Light was thought to travel through ether, so the white balls in the model represent particles of ether in motion. Wheatstone's machines can give a representation of plane, elliptical and circular polarization by superimposing two regular sine waves at right angles to each other: the resultant shape of the wave depends on the phase difference between the two sine waves. The machine is static, giving a snapshot of the wave at any particular moment.

The Wheatstone type of wave machine, although lacking the

science
museum

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attraction of a dynamic model, became a popular low-cost teaching aid. Michael Faraday referred to it, and Royal Society president William Spottiswoode described it as “the best with which I am acquainted”. Wheatstone was particularly proud of it, and chose it out of his many inventions to feature in his family photograph.

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www.sciencemuseum.org.uk