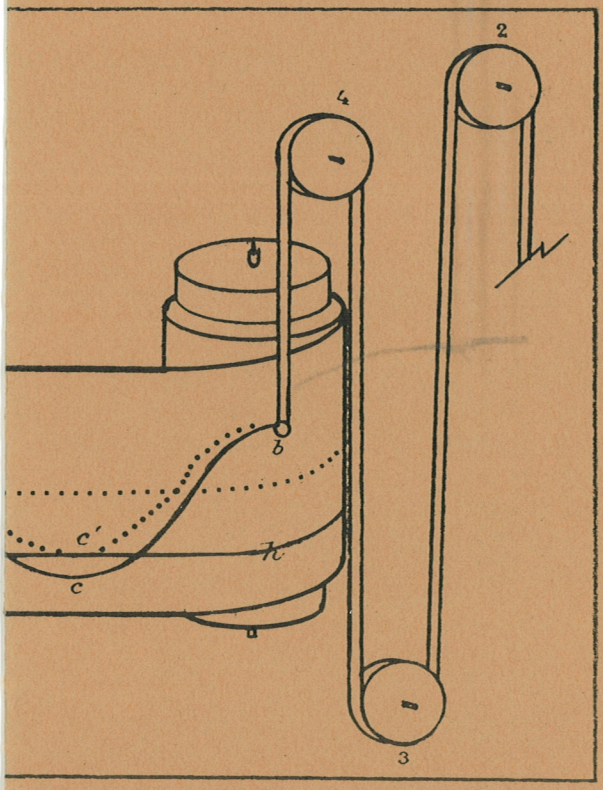
U.S. DEPARTMENT OF COMMERCE
National Oceanic and
Atmospheric Administration

OLD BRASS BRAINS



The instrument shop of the U.S. Coast and Geodetic Survey, a forerunner of the National Oceanic and Atmospheric Administration's National Ocean Service, designed and built "Old Brass Brains," as it has been nicknamed. It's a tide prediction machine and with it you could predict the time of the tide next year, next decade, or next century at any number of places around the world. Or you could go back in time and have the machine determine when the tide rose and fell at a particular port in 1000 B.C.

Observations and investigations of tides have been performed by the National Ocean Service and its forerunners since the middle 1800's. These observations provide basic data for surveying, as well as supply essential information for safeguarding maritime commerce. They also aid engineering projects associated with the commercial and industrial development and protection of coastal property, and various scientific, legal, recreational, and defense activities.

Tides are governed first by the sun and the moon and secondly, by the

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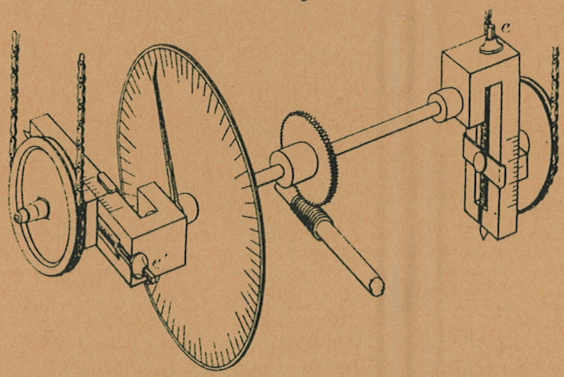
topography of the coastline. Each wheel on this machine can be set to represent the influence of the various elements that affect the tides--moon, sun, depth of a bay, width of an inlet, offshore islands, etc. It can do in 1 day what it would take



125 mathematicians to perform in the same length of time. Made of brass, it consists mainly of a framework and countless big and little wheels connected by chains.

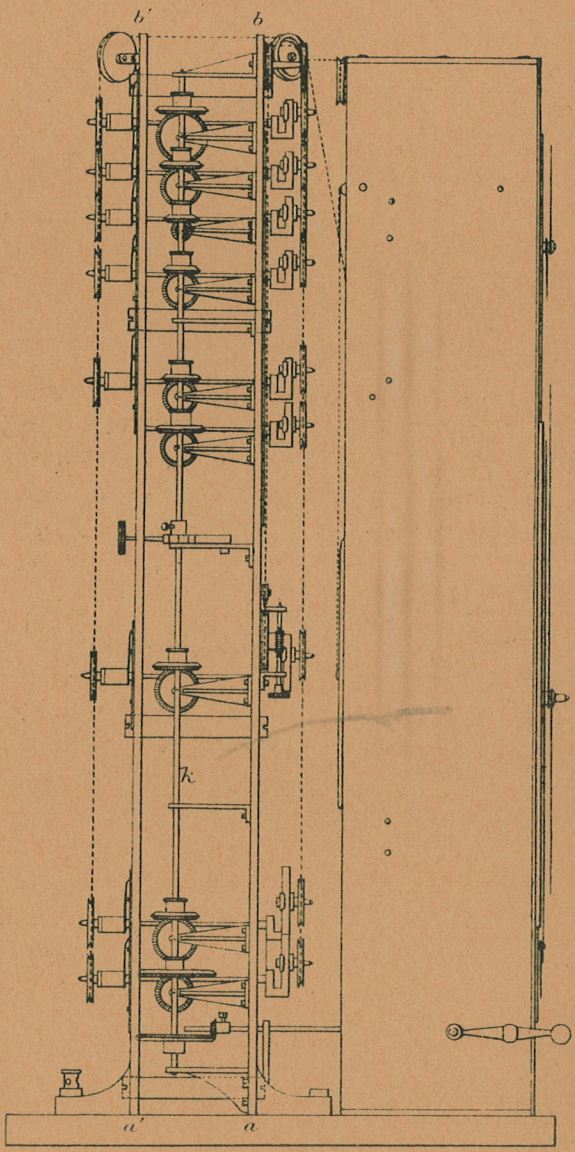
The rise and fall of the water was observed more than 100 years ago at a limited number of places by crude but effective methods. The idea for a mechanical device for predicting the rise and fall of the tides was first suggested in 1845, but it was not until 1872 that the

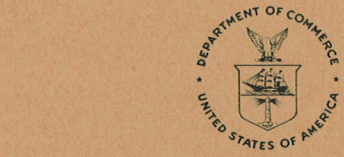
first such method was devised by Sir William Thompson of England. Several such machines were designed and built by the British between 1872 and the early 1900's. The first American predictor was designed in 1882 by Professor William Ferrel of the U.S. Coast and Geodetic Survey.

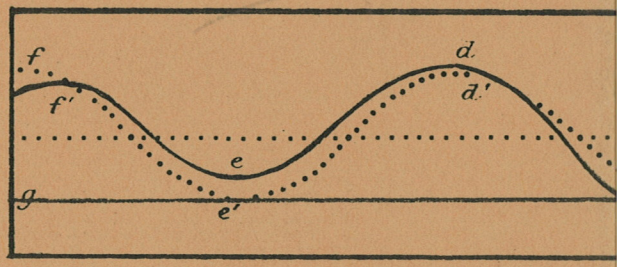
This machine was used until 1910, when a second machine was designed and built by Dr. R. A. Harris and E. G. Fisher also of the Coast and Geodetic Survey. This new predicting machine, which was to serve for the next 55 years, was far more elaborate and comprehensive than any such device previously constructed anywhere. In turn, it was replaced in 1965 by a modern electronic marvel, which can do in 1/2 minute what it took the old machine 6 hours to accomplish.

Besides "Old Brass Brains," it has been called "Old Brass Bolts," "The Great Mechanical Wizard," and other odd names. No matter what it was called, it operated without a single breakdown from 1910 to 1965 and was truly a wonder of its time. It is said the machine was the Federal government's first computer.

Top view of the framework of America's first tide predicting machine.







February 1989