

THE GIANT CAMERA OF THE COAST AND GEODETIC SURVEY.

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The following are extracted from a report of press :

Those to whom "camera" means a box carried about in the hand may properly be astounded at the mammoth instrument, 31 feet in length and 14 tons in weight, capable of taking a picture 50 by 50 inches in size, now used in reproducing the nation's nautical charts and airway maps. Such a "camera" has just been put to work in the basement of the Commerce Building after two years devoted to its design, construction, adjustment, and calibration, at a total cost of \$ 15,240.

Admiral R.S. PATTON, Director of the U.S. Coast and Geodetic Survey, states that this gigantic instrument will make it possible to photograph a complete chart on one negative — a decided reduction in the cost of chart production.

According to Admiral PATTON, it is probably the world's largest precision mapping camera, and represents another advance in high accuracy and an increase in the speed and efficiency of chart reproduction, so essential to the safety of navigation. It is capable of reproducing chart drawings with a probable error of only one or two thousandths of an inch, an error so small that the eye can scarcely detect it without a microscope.

Revision surveys will be appreciably expedited, since they may now be made directly on accurate photographs of the older surveys, the changed areas being surveyed only to a satisfactory junction with the unchanged portions shown on the copy. The new camera photographs the revisions so accurately that they fit into their places on the chart with the same precision that interchangeable bearings fit into their places in the modern automobile.

The frame resembles a railroad bridge structure, with its 27-inch "I" beams, and fills the room. It is suspended on three groups of chains, from girders resting directly on the building foundations. These chains permit the camera to swing free from any horizontal building vibrations, while provision has been made for cork pads to damp out vertical vibrations. The 3-point support also makes the camera independent of any settling of the foundations.

The plate-holding end is partitioned off to form a darkroom, permitting the massive negatives to be sensitized, exposed, and developed without bothering with plateholders.

Direct as well as the usual reversed negatives can be made, by means of an auxiliary reversing copyboard and mirror. A special support permits the removal and replacement of the reversing mirror without disturbing its delicate adjustment. The copyboards are held in accurate alignment with preloaded opposed ball bearings.

Although each copyboard weighs almost a ton, it can be moved along its track by the pressure of a finger tip and then set into position to within a thousandth of an inch by a scale fixed to the overhead track, read by an optical vernier in a periscope.

"Every piece of steel is a spring", according to Lieut. O.S. READING, who had charge of the development of this camera, "but this frame springs less than one-hundredth of an inch for any position of these one-ton copyboards. Any more bending would throw the copyboards out of parallel with the negatives enough to exceed the allowable error, for tilting them would do the same thing to our photographs of charts that tilting a small hand camera does to the picture of a tall building".

All available sources of information were investigated in designing the camera, including commercial copying cameras, and the photographers using them were consulted. The over-head frame used by the Geological Survey was adopted and much valuable information obtained from technical experts at the National Bureau of Standards. Preliminary designs were prepared at the Naval Gun Factory Sight Shop.
