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THE RELATIVE BEARING AND TARGET ANGLE TRAINER

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(or First & Final?)

Prepared by
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6 October 1945

APPROVED: Captain C. W. Shilling, (MC), USN, MO-in-C

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CONSTRUCTION

The Relative Bearing and Target Angle Trainer consists of a small box, easily moved from classroom to classroom, on the front surface of which are located two model ships each placed in the center of a bearing circle and lined up on a 000 bearing. These ships can be mechanically rotated, changing the relative bearing and the target angle. The bearing circles, however, are opaque, and the calibrations can be read only when the light source from within the box is on.

The trainer itself is a plywood box 32" long, 15" high, and 10" wide. A small motor (photo 2) activates the two Lucite discs (photo 4) by a chain drive. These discs are painted black on one side, with the relative bearing calibrations scratched through the paint in such a way that they will show up clearly when the light source within the box is on. The discs are mounted just inside the box on drive shafts and are one inch larger in diameter than the aperatures to prevent light leaks. The aperatures are completely covered by green (starboard) and red (port) glass filters (frosted glass, tracing cloth, cellophane, celluloid, etc., may be used in place of glass) to prevent the students from seeing the calibrations on the bearing circles until the lights are turned on inside the box, the entire interior surface of which is painted white to distribute the light as evenly as possible.

The model ships are mounted on the front face of the box above each bearing circle with a 000 heading and are secured on the ends of the drive shafts protruding from the center of the filter aperatures. The mechanical drive for the ships and the bearing circles is so arranged that the starboard ship will make one complete revolution to eight complete revolutions of the port ship. This makes every conceivable relative bearing or target angle arrangement possible.

The lights, and the motor which rotates the models, are controlled by two push-button switches, mounted in the same holder and secured at the end of a six foot length of heavy insulated electric cord (see lead, photo 1). This allows the instructor a great deal of freedom of operation. The device is portable and can be used wherever electricity is available. (If desired, it could be made smaller, with the ship model rotation controlled manually and the lights operated by dry cells contained within the device itself).

METHOD OF USE

In using the Relative Bearing and Target Angle Trainer in classroom instruction, the device is located at the head of the classroom, clearly visible to all students (see photo 1).

In teaching the estimation of relative bearings, the instructor uses this device to explain the basic principles involved, keeping the bearing circle discs illuminated during the initial presentation. Following the presentation of the fundamentals, a drill is held, using one model for the observers' ship, the other as the target ship. The instructor rotates the models, with the illumination off, to the desired bearing. Students estimate this bearing, either orally or in writing. The instructor then pushes the light button, showing the true bearing clearly to the class. This process is then repeated, until the instructor is satisfied that the class has grasped the basic idea of relative bearing estimation. Further drill sessions are conducted on a Lookout Trainer, or in outdoor drill.

With instruction in target angle estimation, essentially the same procedure is used. The Trainer reported on herein is used only to explain the basic principles involved, followed by a short drill period to reenforce the presentation. All further work in target angle estimation is done with a three-dimensional

instruction device, which has more realism and insures a higher degree of transfer of training.

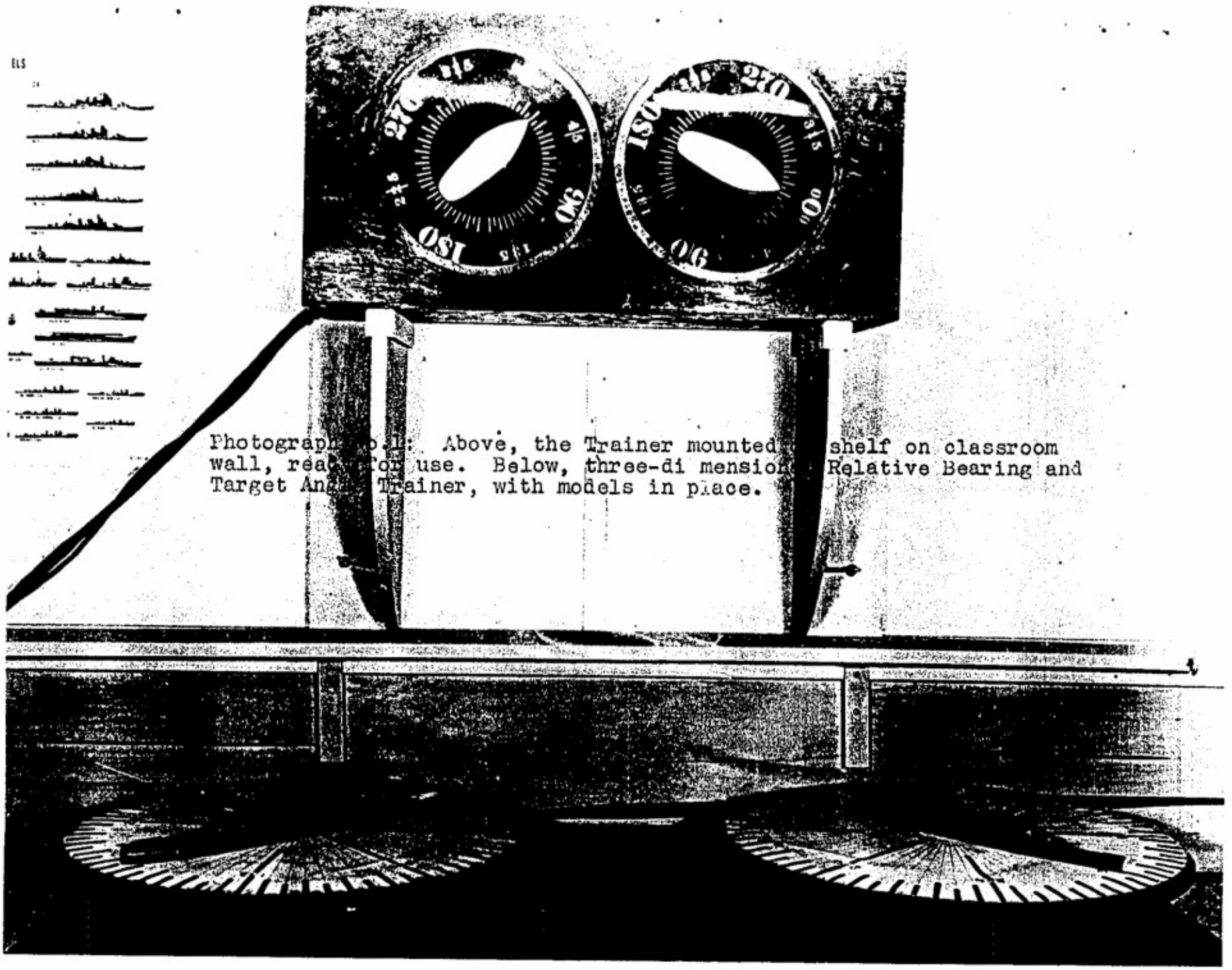
SUMMARY OF ADVANTAGES

The Relative Bearing and Target Angle Trainer does not give the student the correct relative bearing or target angle until the instructor desires to reveal it by pushing the light switch. The instructor may rotate the ships into any desired position by operating the "motor" button of the control.

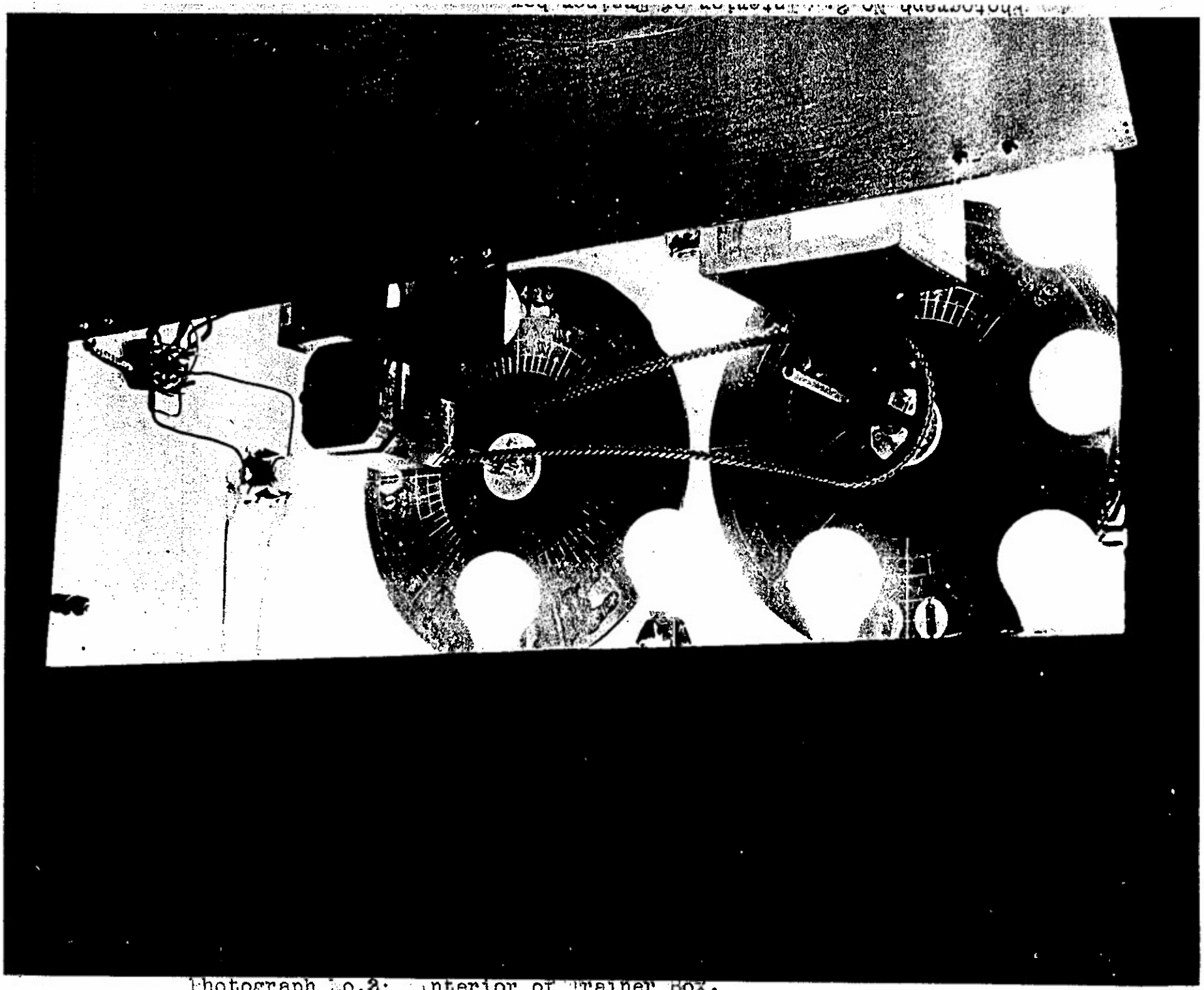
Electrical operation eliminates manual changing of the ships' relative position, and makes for rapid, effortless instruction. This ease of operation is a definite advantage since all irrelavent movement on the part of the instructor can be kept to a minimum.

The filter and light system eliminates the necessity of using cumbersome screening devices to conceal the bearing circles from the student while relative bearings or target angles are being estimated.

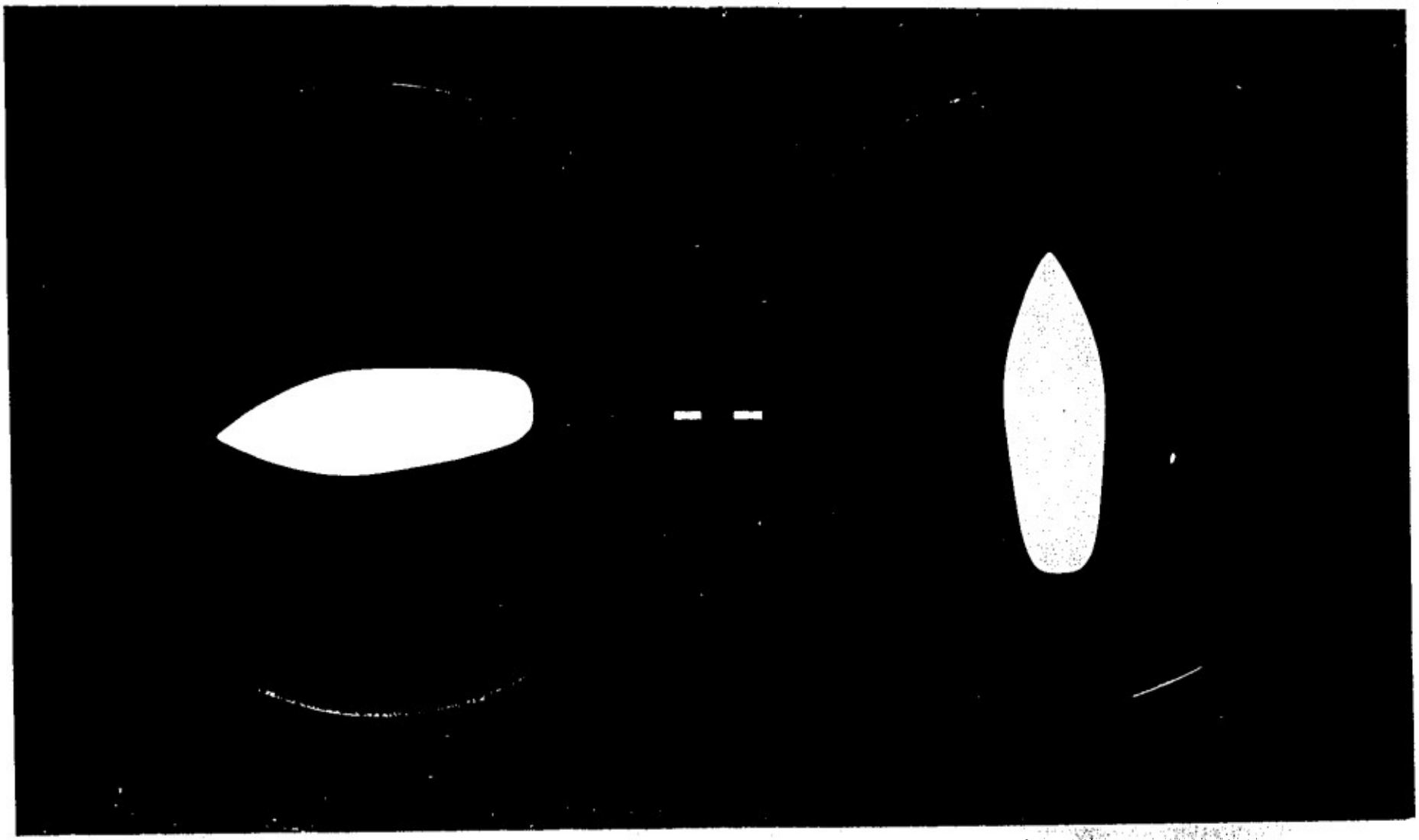
The trainer is easily constructed, of materials readily available at most activities.



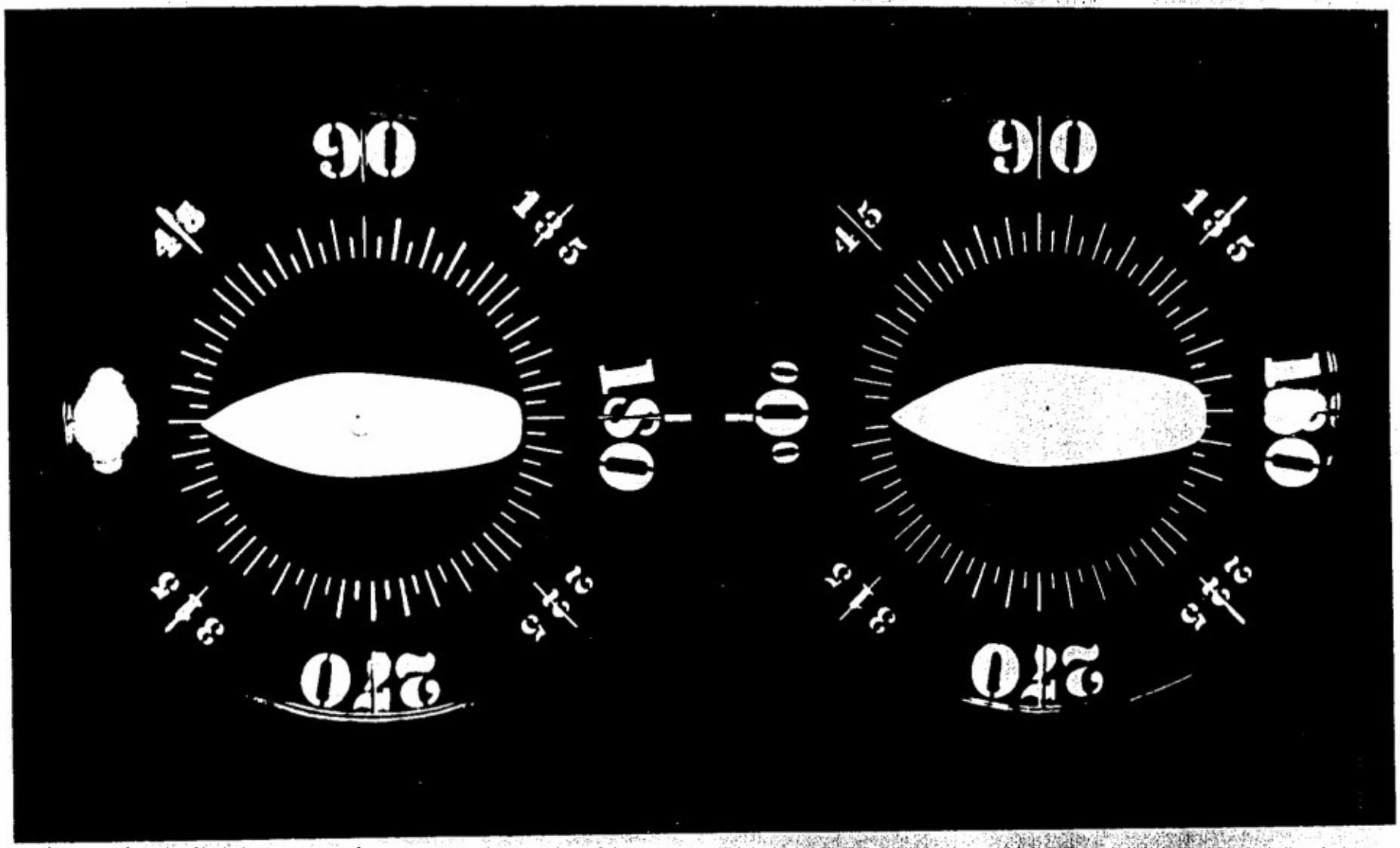
Photograph No.1: Above, the Trainer mounted on shelf on classroom wall, ready for use. Below, three-dimensional Relative Bearing and Target Angle Trainer, with models in place.



Photograph No.2: Interior of Trainer Box.



Photograph No.3: Front view, with illumination off.



Photograph No.4: Front view, illumination on.