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A Portable Field Chemistry Kit

by

C. J. D. Brown and Clarence M. Flaten

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The chemistry kit described below has been developed over the past 10 years to meet the need for a durable, portable outfit containing all of the essential chemicals and equipment to make analyses on approximately a dozen water samples for dissolved oxygen, carbon dioxide, alkalinity (phth. and M.O.) and pH. Some of the features of this kit have been copied directly from the chemistry boxes prepared by Dr. P. S. Welch, Dr. F. E. Eggleton and others. However, these have been modified in order to make the kit more complete and portable.

We do not wish to present arguments here to show that satisfactory results can be attained with such equipment but suffice it to say we have satisfied ourselves by numerous tests that consistent results within the limit of the error of standard field methods can be attained. The absence of ring stand, graduate, beaker and casserole will no doubt cause concern to those used to final analyses in the laboratory. Needless to say it is often not possible in reconnaissance survey work to have access to laboratory or even base camp facilities.

Construction of Kit

The details of size and construction are shown in Fig. 1. Clear white pine has proven to be very satisfactory for the box proper. It is light, durable and easily worked. Most plywoods are too heavy when properly reinforced. Compartments have been made with $\frac{1}{4}$ inch pine and a medium weight sheet metal. Copper or sheet metal strips reinforce all corners. These are screwed on. The pipette-burette rack is $\frac{1}{4}$ inch tempered masonite. It is removable and held in place by a brass spring latch. The clips for holding pipettes and burettes are the ordinary spring brass fuse clips obtainable from most auto supply stores. Folding legs (Fig. 2) made of brass give the lid support when the box is open. The total cost of materials for one unit is approximately \$4.00 and labor about \$10.00.

Contents of Kit

This kit is designed to hold a "Hellige Comparator" pH outfit. Modifications would have to be made for other types of pH equipment. The Hellige comparator is compact and sturdy and the range of most natural waters can be covered by three discs.

Reagent bottles are of two sizes, namely 60 and 100 cc. Since bottles are so variable in size, it is a good plan to build the compartments to snugly fit a selected given set of bottles. The type of top a bottle should have is determined, of course, by the kind of solution it is to contain. We have found bakelite tops to be satisfactory for all reagents except con-

*Contribution from the Institute for Fisheries Research, Michigan Department of Conservation.

PORTABLE CHEMISTRY KIT

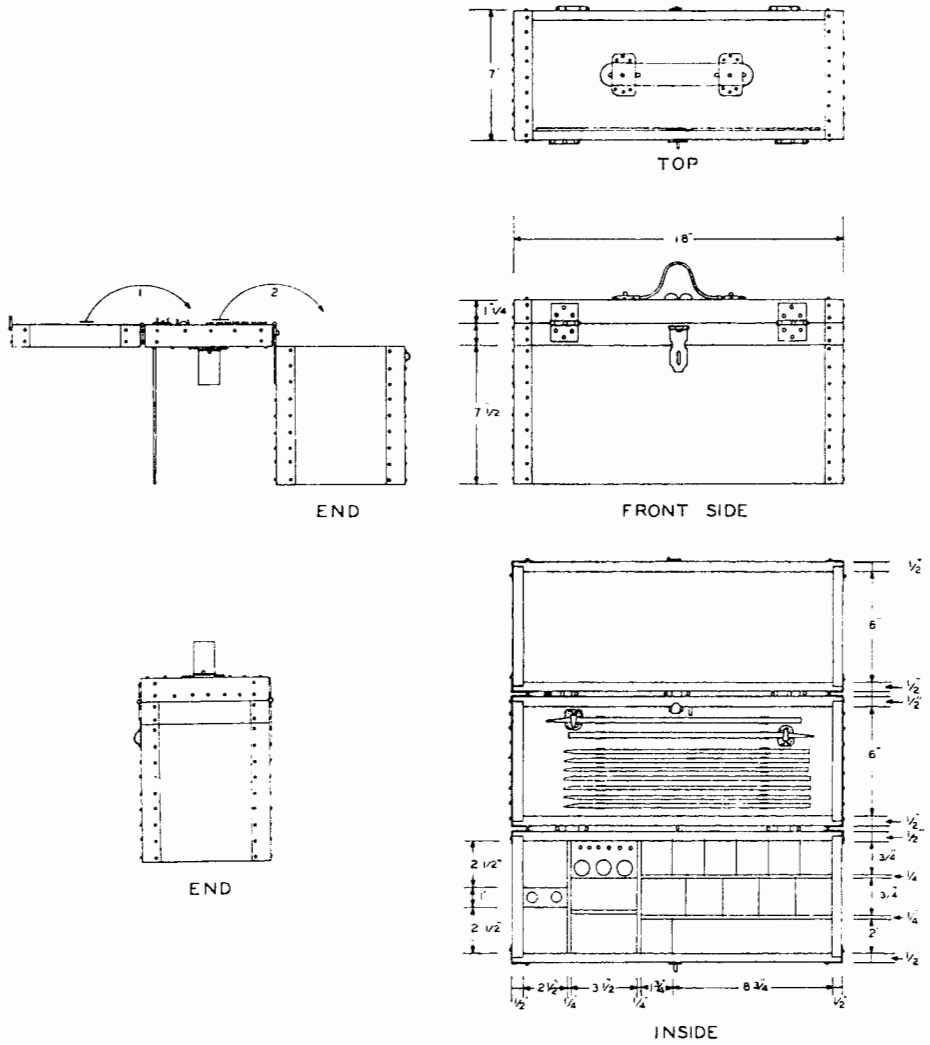


Fig. 1.

centrated acids. The sample bottles (two in number) are ordinary 250 cc.

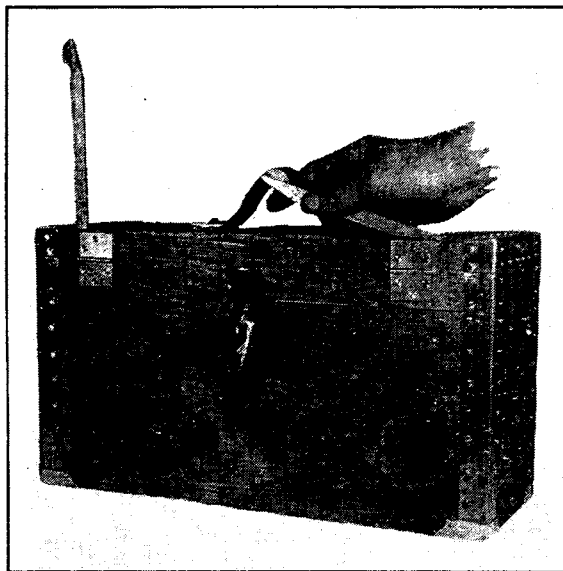


Fig. 2—Front view of closed kit, showing legs which fold into lid.

glass stoppered type. These are calibrated at 100 and 200 cc. Titrations for oxygen and alkalinity are made directly into these bottles. There is provision for a 100 cc. Nessler tube for carbon dioxide titrations. Any appropriate pipettes are satisfactory but the kit does not have sufficient length to take other than 10 cc. burettes. A view of the inside of the kit with all glassware and equipment in place is shown in Fig. 3. The cost of glassware for one unit exclusive of the pH outfit is approximately \$7.00.

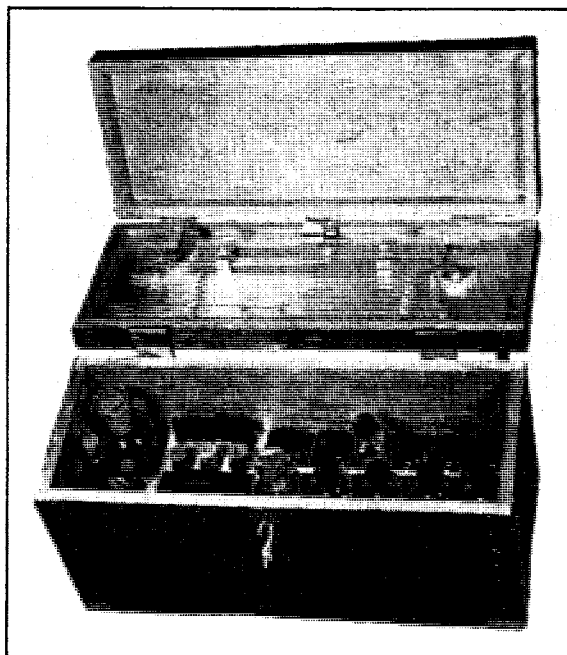


Fig. 3—Top view of open kit, showing glassware and pH outfit in place

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Dr. Brown
Fish Division ✓

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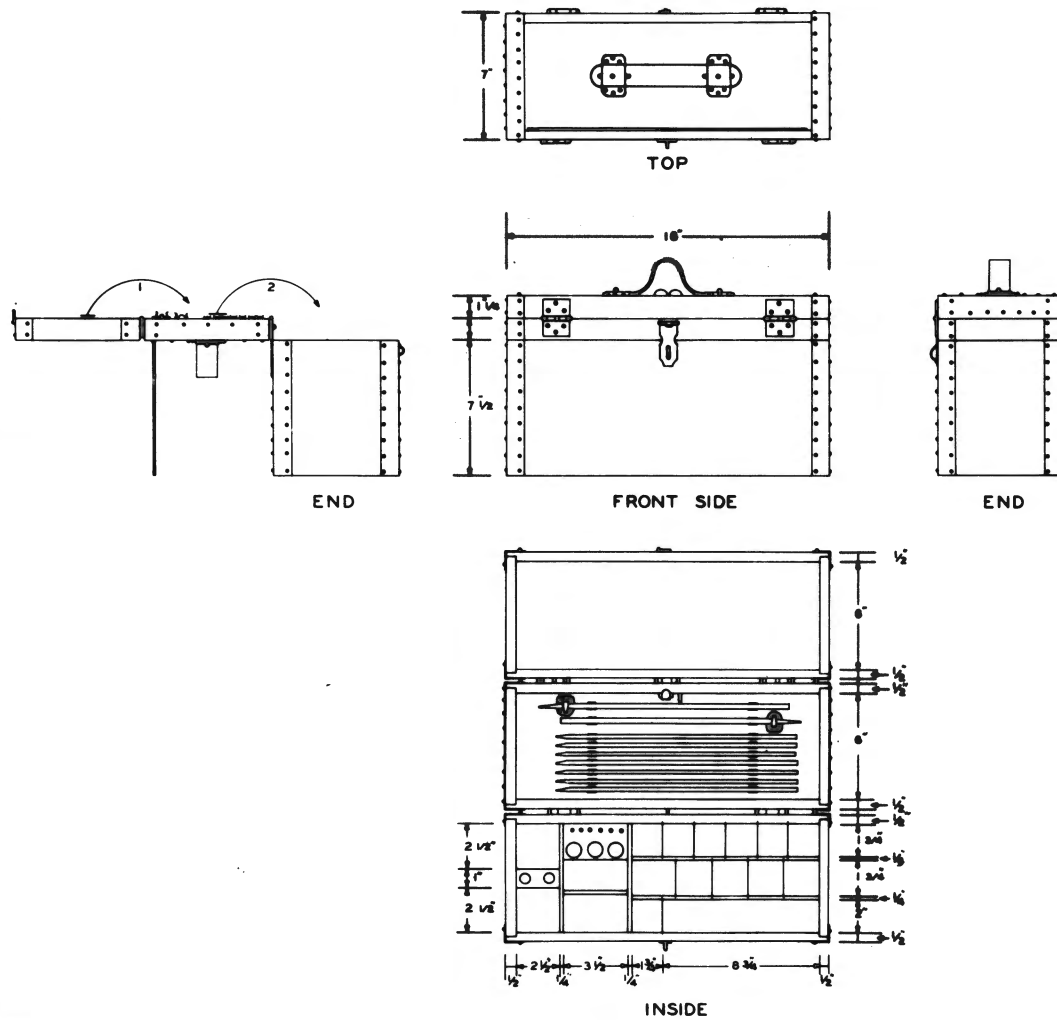
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Fig. 1



Fig. 2. Front view of closed kit showing legs which fold into lid.



Fig. 3. Top view of open kit showing glassware and pH outfit in place.

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Report approved by: A. S. Hazzard

Report typed by: G. Wood