

# SCIENTIFIC SECTION, AMERICAN PHARMACEUTICAL ASSOCIATION

## MULTIPLE OPERATING TABLE COMBINED WITH KYMOGRAPH CASE FOR BLOOD-PRESSURE EXPERIMENTS.\*

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The ever increasing number of routine samples sent to the laboratory for physiologic test has made it necessary to increase the efficiency of our apparatus to economize in time and space and prevent routine from interfering with experimental or research work.

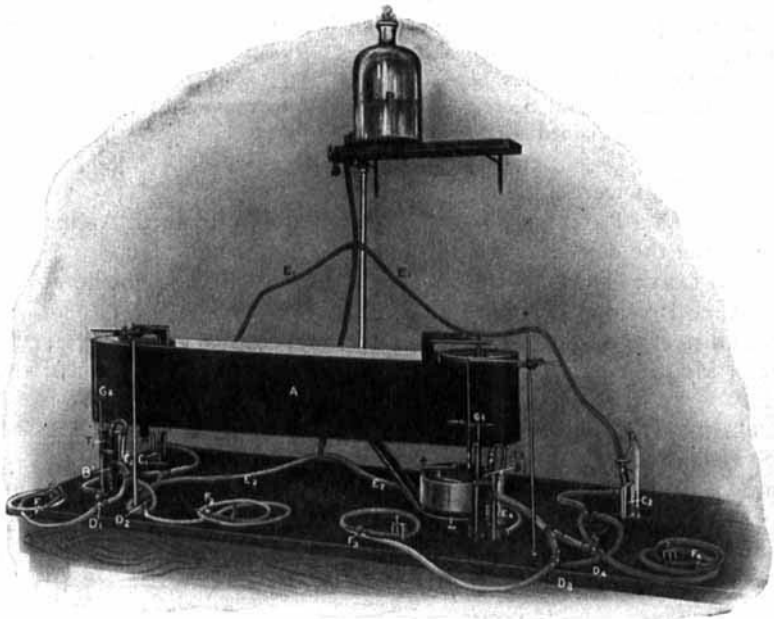


FIG. 1.—Kymograph arranged for making blood-pressure tests on four animals at one time. A, long paper kymograph; B1 and B2, manometers, with writing points; G1 and G2, writing points; C1 and C2, dummy manometers, without writing points; D1, D2, D3 and D4, three-way stop-cocks; E1, tubes used for securing pressure in manometers C1 and C2, from pressure bottle P; E2, tubes used for securing pressure in dummy manometers, B1 and B2; F1, F2, F3 and F4, cannulae; H1, H2, H3 and H4, connecting tubes; T1, T2, T3 and T4, stop-cocks.

In a previously published paper,<sup>1</sup> I described an apparatus with which it is possible for one person to carry out blood-pressure tests on four animals at the same time and record all the tracings on one kymograph. This improved kymograph finds its greatest value in blood-pressure tests which, of all the physiologic methods, consume the greatest amount of time. This is true particularly in the blood-pressure test for ergot in which it is necessary to check the results on two or three dogs and, on account of cumulative action, to allow one to one and a

\* Read before Scientific Section, A. Ph. A., Atlantic City meeting, 1916.

<sup>1</sup> "An Improved Form of Kymograph," J. A. PH. A., December, 1913.

half hours to elapse between injections. With the usual method, using one manometer and kymograph, it is possible to work with only one animal at a time, requiring the greater part of two days to assay one sample of ergot in duplicate. Frequently, four or five samples of ergot are submitted in one lot for test and eight to ten days would be required.

This difficulty is overcome by the use of the improved kymograph shown in Figs. 1 and 2. The animals are anæsthetized and the carotid arteries and saphenous veins are exposed. A cannula (F1, F2, F3 and F4) is then tied into the carotid artery of each dog. Pressure is obtained within the various tubes from

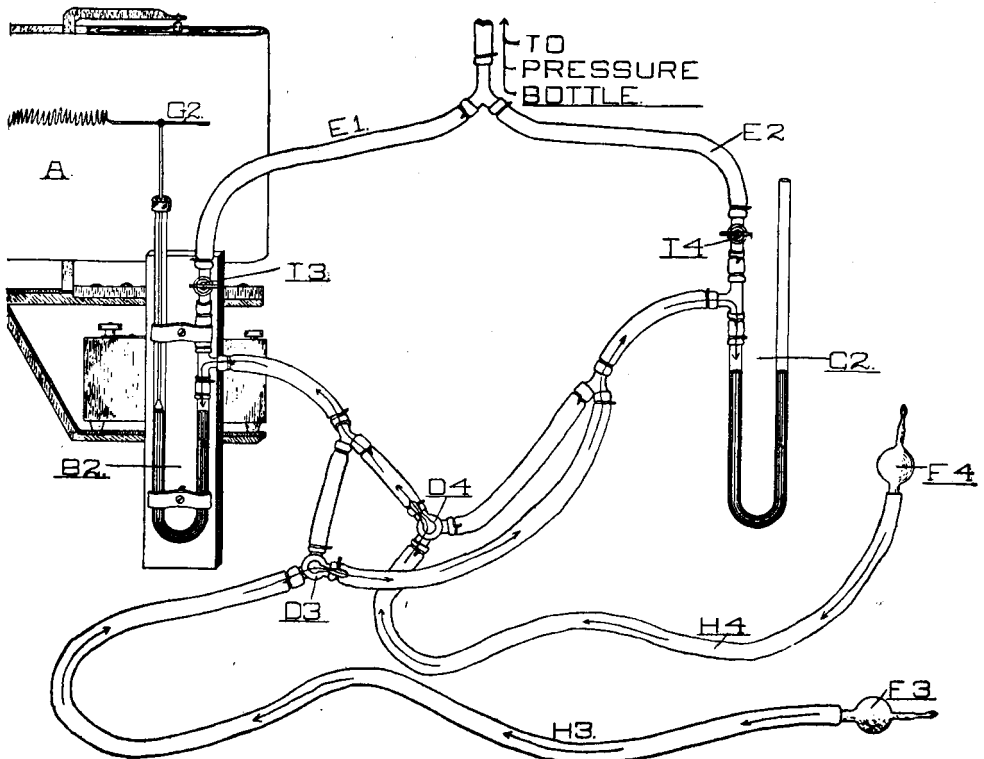


FIG. 2.—A graphic illustration of the arrangement of one-half of the apparatus. The letters and figures used in this illustration correspond to those used in Fig. 1.

the pressure bottle (P) by opening the cocks (T1, T2, T3 and T4) (T2 invisible). It will be noted from Fig. 1 that each connecting tube (H1, H2, H3 and H4) terminates in a three-way stop-cock which enables the operator to connect it with either a manometer which writes on the smoked drum, or with a "dummy" manometer.

To assay two samples of ergot, two dogs are placed on one end of the kymograph for one sample and two on the other end for the other sample. The three-way stop-cocks are arranged in such a manner that one dog on each end records its pulsations upon the revolving drum, while the other pulsates against a "dummy" manometer. Inject the proper dose of fluidextract of ergot into the dog which is recording its blood-pressure on the right-hand side of the kymo-

graph; allow the drum to revolve five, ten and fifteen minutes after the injection. Then by merely reversing the stop-cocks (D3 and D4), the dogs can be inter-

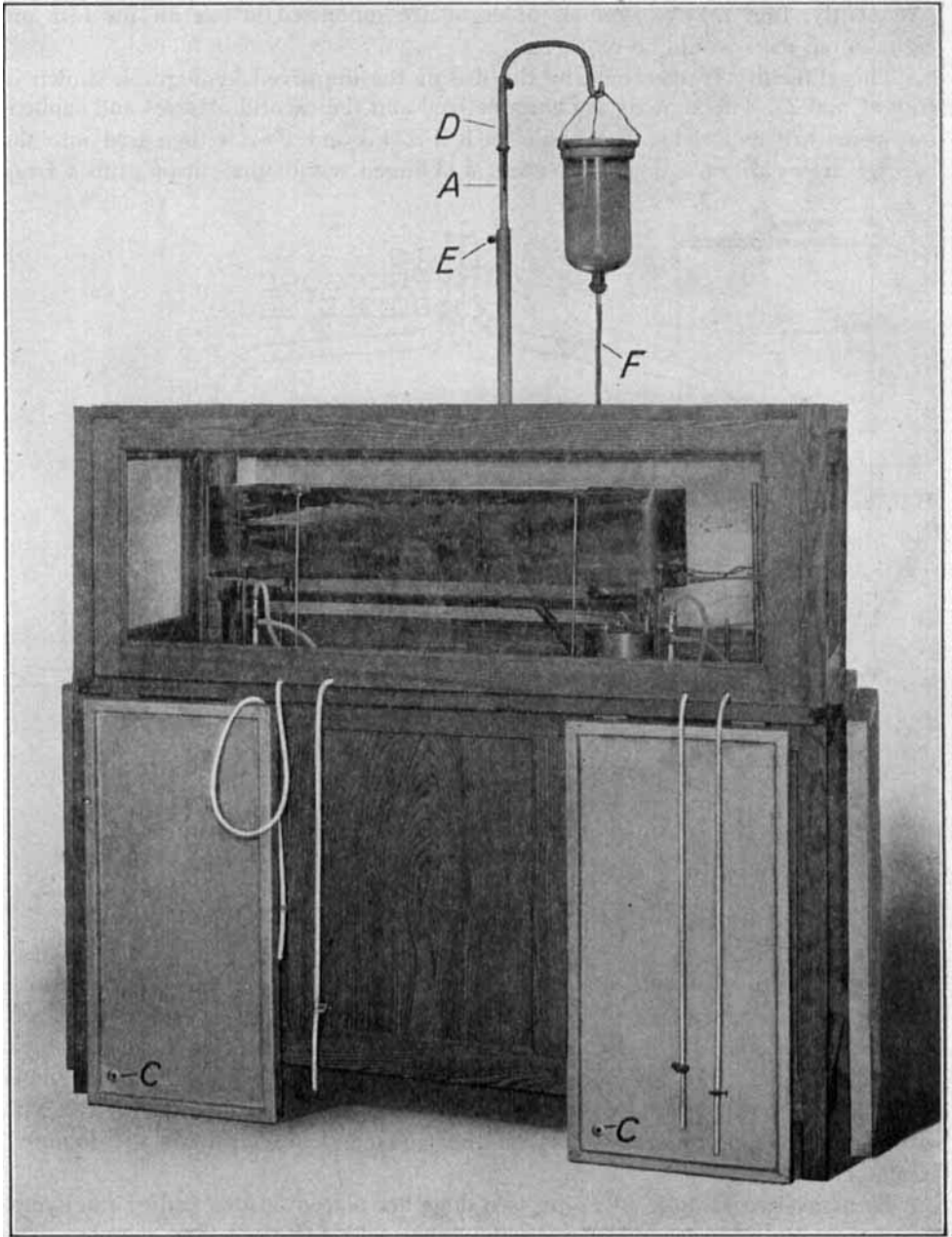


FIG. 3.—Multiple operating table combined with kymograph case (closed).

changed, or, in other words, the dog which was recording its blood-pressure on the smoked drum will pulsate against the mercury in the “dummy” manometer, and the one which was previously pulsating against the “dummy” will record its

normal blood-pressure upon the smoked drum. After taking a normal tracing of several inches in length, stop the drum; then check the former results by injecting this dog with the same preparation given to dog No. 1; again, take tracing five, ten and fifteen minutes after the injection. Repeat operation by injecting, in a similar manner, the other sample into the dogs on the left-hand side of the drum. This will consume about one hour and fifteen minutes. It is then necessary to wait only about fifteen minutes or until the one and a half hours have elapsed since the first injection was given when the entire procedure can be repeated. This is continued until each dog has received three or four

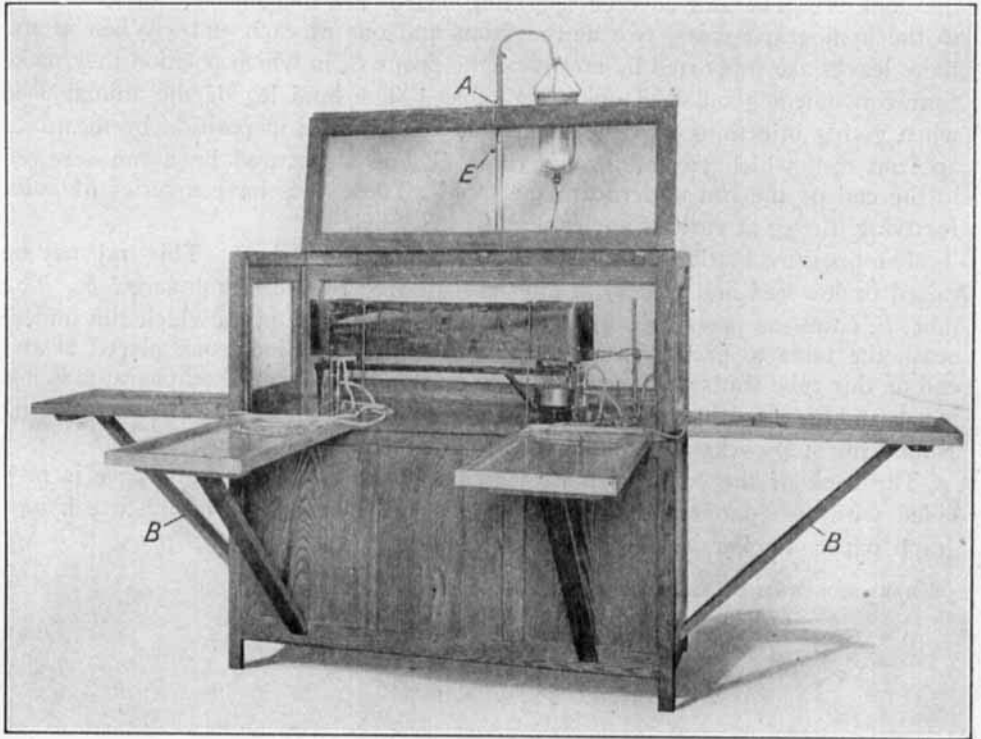


FIG. 4.—Multiple operating table combined with kymograph case (open).

injections. The charts are then measured and the average rise of pressure produced by each preparation is taken as its figure of potency.

To assay one sample of ergot in duplicate and one sample of adrenal extract it is necessary to employ only three animals, two on the one end for ergot and one on the other end for adrenal extract.

We found that the advantages of the improved kymograph were partially offset by the waste of time spent dusting and cleaning the apparatus due to the delicate construction of the manometer, etc. The apparatus also required the use of four individual operating tables, which, when not in use, occupied a considerable amount of valuable laboratory space. It was thought advisable, therefore, to build some sort of case to protect the apparatus from dust and thus reduce the time and attention necessary to keep it clean and to combine with such a case

folding or collapsible operating tables which would occupy a minimum amount of space when not in use.

The apparatus described below was devised with these requirements in view. It has been in use in our laboratory for some time and has proven itself invaluable for conserving both time and laboratory space.

Figs. 3 and 4 are self-explanatory and make it unnecessary to describe the apparatus in detail. It will be noted that the kymograph is covered with a glass case, the two ends and back of which are stationary while the top and front are hinged in such a manner that the case may be opened or closed by raising or lowering the top. While the apparatus is in use the case is held open by means of the hook *A*. The zinc-covered operating boards are hinged like "table leaves" to the kymograph case—two at the front and one at each end. When in use these leaves are supported by means of the props *B*, in which position they make four convenient good-sized operating tables. The hind leg of the animal used when giving injections into the saphenous vein, is held in position by means of an iron rod, which passes through hole *C*, and is secured by a nut screwed to the end of the rod underneath the table. These rods have a series of holes for tying the leg at various angles.

The pressure bottle is supported by a sliding iron rod, *D*. This rod may be raised or lowered and is held at any level desired by the thumb screw *E*. The tube, *F*, from the pressure bottle is connected with brass pipes which run underneath the table to each of the four manometers. A pinch-cock placed at the end of this tube shuts off the pressure from the bottle when the apparatus is not in use, and prevents the magnesium sulphate solution from leaking and crystallizing around the stop-cocks and connections of the manometers.

The back of the enclosed table which supports the kymograph case is provided with two doors and makes an excellent place in which to store kymograph paper, smoker, smoking stand, etc.

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