A PHOTOGRAPHIC METHOD OF RECORDING THE ARTERIAL BLOOD PRESSURE

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We have devised an apparatus for recording the arterial blood pressure photographically, consisting essentially of a mercury manometer, a photographic lens and a photokymograph.

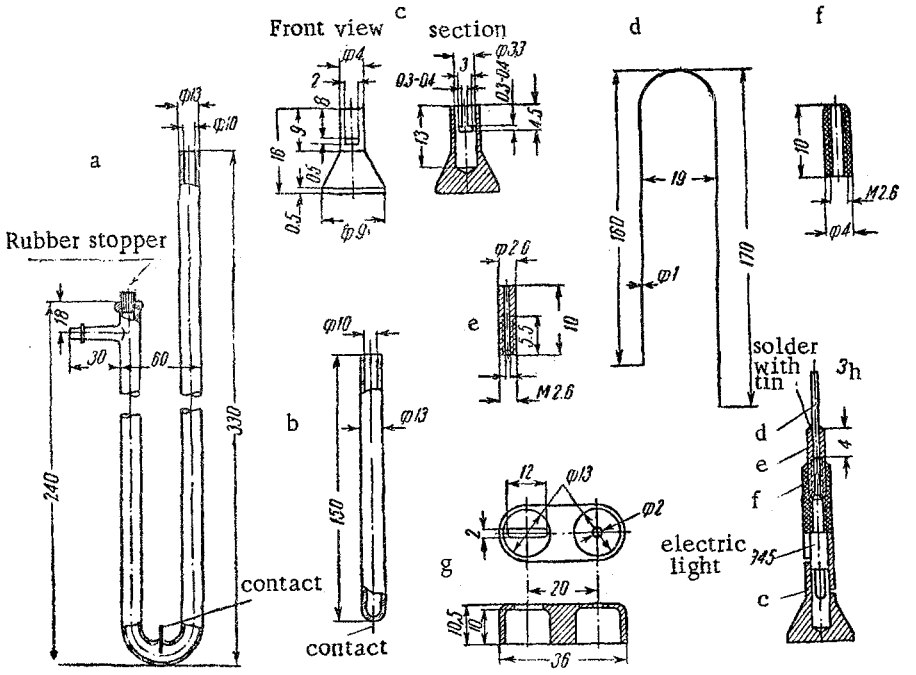

Fig. 1. Outlines of the main details of the manometer. a) V-shaped glass tube with soldered-in contact; b) straight glass tube with soldered-in contact; c) stainless steel float; d) steel wire contact; e) brass connector; f) ebonite bush; g) brass adjusting cap; h) outline of assembled details c, d, e, f, and E-45 electric lamp (where it is impossible to solder the contacts in parts a and b, they may be introduced into the mercury through a vertical orifice in the left tube of part a , closed with a rubber stopper, and from the cap g in part b).

The scheme of this apparatus is shown in Fig. 2. In the tube of a mercury manometer 1 is placed a miniature electric light 2, mounted in a float 3, in the wall of which is a small opening for the passage of light. The

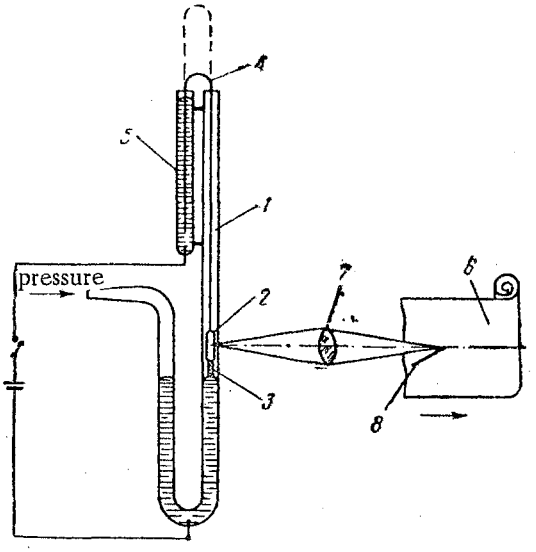

Fig. 2. Scheme of the manometer. 1) Manometer 2) electric light E-45, as fitted to endoscopic apparatus; 3) stainless steel float; 4) wire contact; 5) tube with mercury contact; 6) photographic paper; 7) photographic lens with focal length 135 mm; 8) pressure tracing curve.

lamp is connected to the central contact by means of a steel wire 4, bent to form a loop, the short end of which is placed in a tube 5, filled with mercury.

In the lower, closed ends of the manometer 1 and the tube 5 are soldered electrodes, in contact with the mercury, to which are applied an emf of 3 volts (for example two dry cells). The current to the lamp passes through the mercury contacts of the tubes 1 and 5, and through the float 3 and the wire 4 respectively.

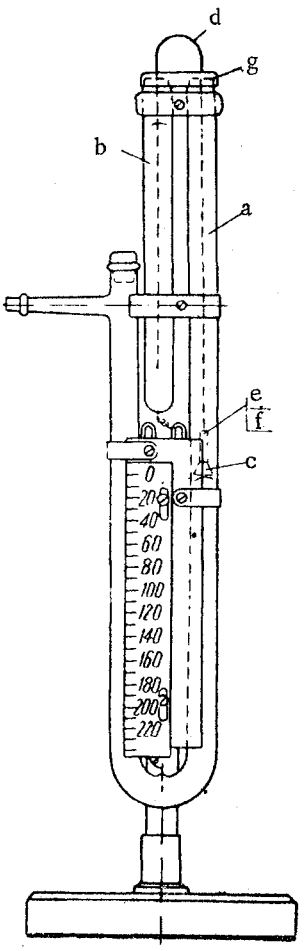

Fig. 3. General appearance of the manometer; legend as in Fig. 1.

When the arterial pressure rises, and with it the level of the mercury in the manometer, the float 3, together with the lamp 2, moves upwards along the tube 1. The displacement of the lamp is recorded on the moving photographic paper 6 of the photokymograph by means of the lens 7, in the form of the curve 8.

The lens 7 is immovably situated between the manometer and the photokymograph, at a suitable distance to allow the formation of a sharp image of the filament of the lamp on the photographic paper. The dimensions of the image are restricted by the aperture in the float 3.

This method of recording enables the arterial pressure to be traced on ordinary photographic paper simultaneously from several manometers, using one lens.

By this method it is possible to record changes in the arterial pressure both during an acute experiment and when a sphymometric method of recording is used.

The scale of the pressure tracings can be varied at will, depending on the conditions of the experiment and the width of the photographic paper. The quality of the curves permits pressure changes to be distinguished with an accuracy of 1-2 mm Hg.

Construction of the manometer is simple, and may be carried out in an ordinary workshop in accordance with our diagrams (Figs. 1 and 3).

SUMMARY

The paper presents a description of a photographic device for recording the arterial blood pressure. Its main feature is a mercury manometer equipped with a miniature incandescent lamp fixed on a float in the manometer tube.

Low voltage electric current is supplied to the lamp through mercury contacts. The float with the lamp follows all the fluctuations in the mercury level of the manometer.

The image of the lamp filament is registered on a photokymograph , in the shape of a curve having a variable amplitude, with the aid of an ordinary photographic lens.

The article includes drawings of the main parts.