(No Model.) 2 Sheets—Sheet 1.

L. E. HILL & H. L. BARNARD.

SPHYGMOMANOMETER.

No. 598,343. Patented Feb. 1, 1898.

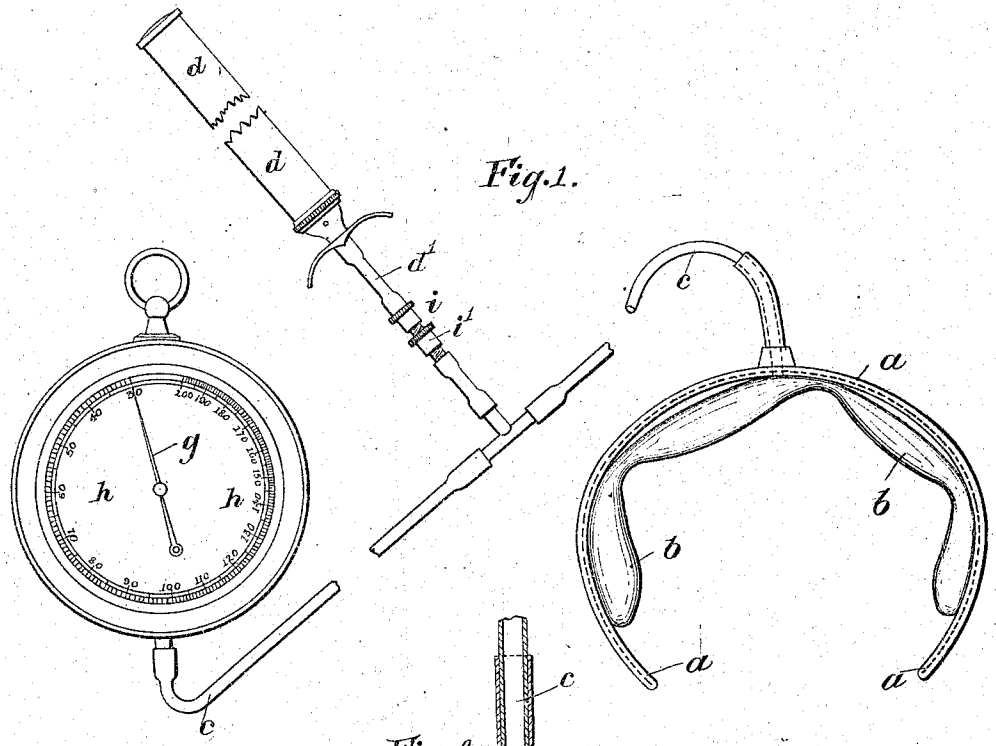

Fig. 1.

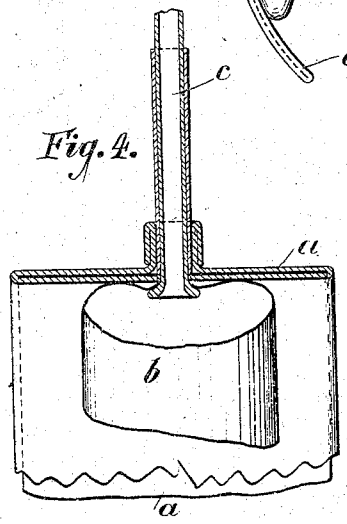

Fig. 4.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

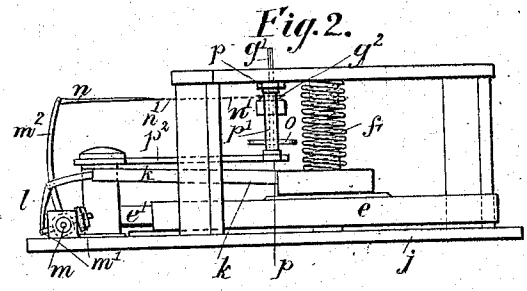
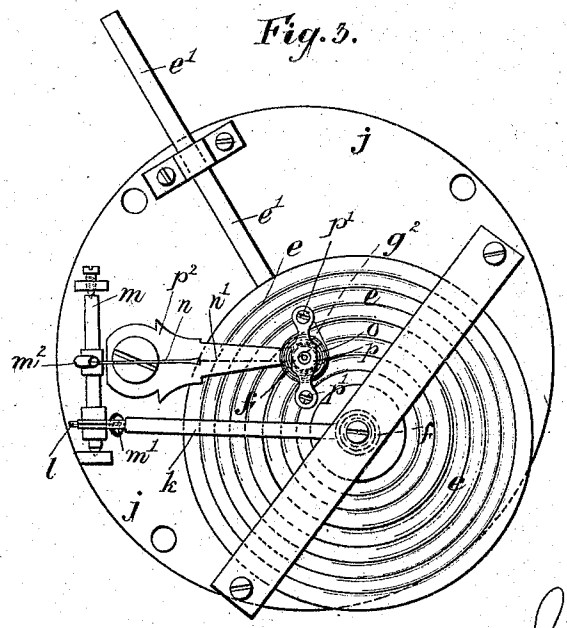


Fig. 3.



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UNITED STATES PATENT OFFICE.

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SPHYGMOMANOMETER.

SPECIFICATION forming part of Letters Patent No. 598,343, dated February 1, 1898.

Application filed July 9, 1897. Serial No. 643,951. (No model.)

To all whom it may concern:

Be it known that we, LEONARD E. HILL and HAROLD L. BARNARD, subjects of the Queen of Great Britain, residing at London, England, have invented certain new and useful Improvements in Sphygmomanometers, of which the following is a full, clear, and exact description.

The invention has for its object improvements in sphygmomanometers whereby not only the blood-pressure in the arteries of man or animal but also the pulsations of the arteries are clearly indicated on a scale, the mean arterial blood-pressure being indicated in our improved instrument by the maximum of such pulsations.

Our invention is illustrated in the accompanying drawings, in which—

Figure 1 is a view of the apparatus complete. Fig. 2 is a side elevation, and Fig. 3 is a plan, of the manometer; and Fig. 4 is a section of part of the spring-clasp separately.

According to our invention we employ a spring-clasp *a*, preferably of steel, covered with india-rubber and lined with a flaccid rubber bag *b* and made to partially or entirely encircle the arm or other part of the body. We connect this rubber bag *b* by a tube *c* with an air-pump *d* and with the tube *e'* of a manometer having a chamber *e* like that of an aneroid barometer, but not exhausted. Such chamber has pressing on its outer side a spring *f*, which is compressed by the pressure of air within the chamber *e* and acts to return the side of said chamber to its normal position when the pressure is relieved. This chamber operates a hand or pointer *g* by similar mechanism to that used in an ordinary aneroid barometer, as hereinbefore described, and said hand or pointer *g* moves over a suitably-divided scale *h*.

The chamber *e* is fixed to the foundation-plate *j*, and it has fixed to its upper side an arm *k*, connected by link *l* with a small adjustable lever *m'*, fixed on the pivoted shaft *m*, to which latter is also fixed a longer lever m^2. This lever m^2 is connected by link *n* and chain *n'* with a pulley g^2 on the spindle *g'* of the hand or pointer *g*, and to such spindle *g'* is attached one end of a spiral spring *o*, the other end of which is connected to one of the pillars *p'* of a frame *p*, carried by the fixed arm p^2, extending over the chamber *e*.

The tube *d'*, attached to the pump *d*, is provided with a valve *i* similar to that used with pneumatic tires, whereby the air-pressure can be gradually relieved when desired by slightly rotating the part *i'* until the maximum pulsation of the hand or pointer *g* is obtained, and it is also provided with an ordinary non-return valve to prevent loss of pressure except when the relief-valve is operated.

The mode of using the apparatus is as follows: The spring-clasp *a* is lightly fixed, say, around the arm. Pressure is then applied by means of the pump *d* until the rubber bag *b* on the inside of the clasp applies sufficient pressure on the arteries to give the maximum pulsation of the hand or pointer *g* and also to give the pressures at which the pulsation appears and disappears as the pressure is raised.

Having fully described our invention, what we desire to claim and secure by Letters Patent is—

A sphygmomanometer, comprising, in combination, a spring-clasp, a flexible air-bag on the inside of such clasp, an air-pump, a tube connecting such flexible bag with the air-pump and a manometer comprising a flexible chamber connected to said flexible bag and a pointer mechanically connected to the flexible chamber of the manometer so as to be moved thereby in response to the pressure, and pulsation of pressure, on the flexible rubber bag.

In testimony whereof we affix our signatures in presence of two witnesses.

LEONARD E. HILL.
HAROLD L. BARNARD.

Witnesses:
B. J. B. MILLS,
CLAUDE K. MILLS.