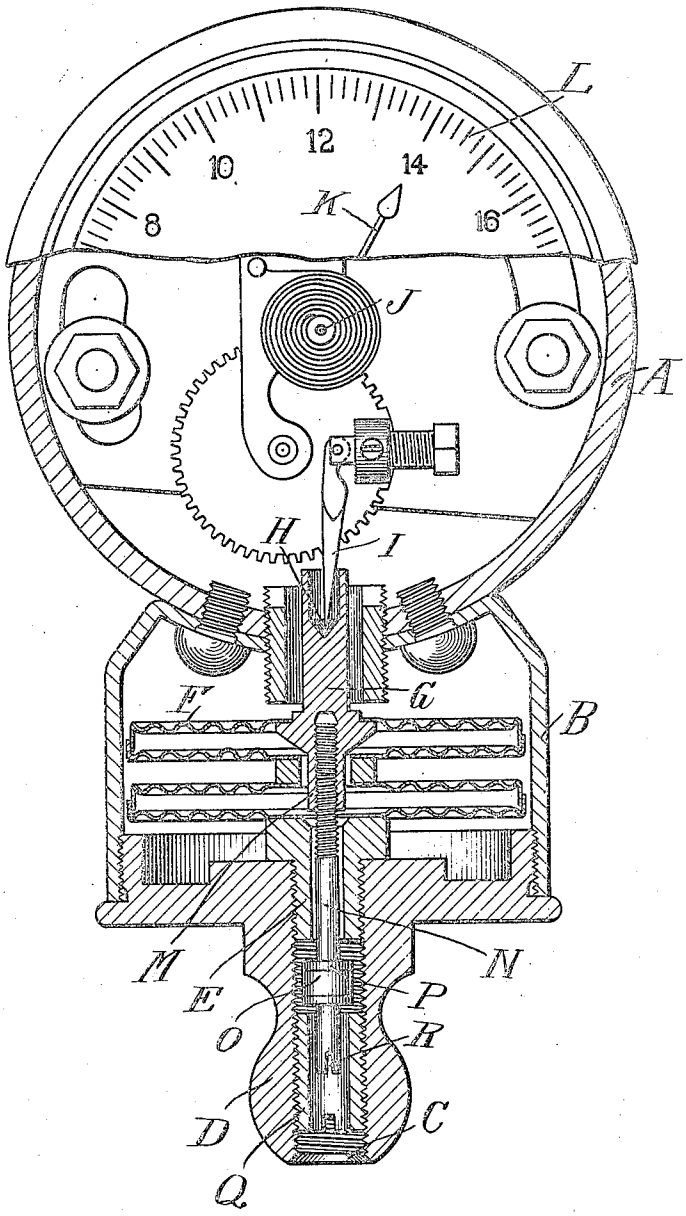
F. E. COLLINSON.

SAFETY DEVICE FOR PRESSURE INDICATORS.

APPLICATION FILED MAR. 6, 1914.

1,239,565. Patented Sept. 11, 1917.



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SAFETY DEVICE FOR PRESSURE-INDICATORS.

1,239,565. Specification of Letters Patent. Patented Sept. 11, 1917.

Application filed March 6, 1914. Serial No. 823,018.

To all whom it may concern:

Be it known that I, FRANCIS E. COLLINSON, of London, England, have invented certain new and useful Improvements in Safety Devices for Pressure-Indicators; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My invention relates to pressure indicators, and more particularly to such as are used in sphygmomanometers and other delicate indicating or recording instruments, and it has for its object to improve the construction of devices of this character so as to obviate fracture or disarrangement due to operating under abnormal conditions. More particularly, the invention consists in the provision of means for affording protection to the flexible or expansible element of the pressure controlled mechanism whereby its movement is limited, so as to prevent its operation beyond a safe point by an unusual pressure or suction. To these and other ends the invention consists in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claim at the end of the specification.

The drawing is a sectional view of an indicator such as used in a usual type of sphygmomanometer showing it equipped with my present improvement.

In the construction shown, A designates a casing including a lower portion B which is provided with an inlet passage C for conveying the pressure to the working parts and a nipple D adapted to receive a flexible tube or other conductor leading to the source of pressure. Secured within the portion D of the casing is a sleeve E having a central opening therein, and which supports the expansible or flexible member to be acted upon by the pressure, the expansible member in the present instance consisting of a bellows-like structure embodying a series of metallic diaphragms F which are connected together as shown and are adapted to move toward and away from each other as the presure falls and rises.

The expansible member is connected to an indicator by suitable operating means, and in the present arrangement it is provided with a central post G secured to the innermost diaphragm F and provided at its upper end with a socket H, adapted to receive the free end of the link I forming a part of the indicator controlling mechanism, which serves to rotate the arbor J upon which is mounted the indicating hand K. The indicator is arranged for coöperation with a scale L as usual in this class of devices.

In the operation of instruments of this type, which are usually constructed to act within certain ranges, it frequently happens that the expansible member is subjected to an excessive pressure, or an excessive suction, as for instance when the connecting tube is jerked or suddenly removed from the end of the casing and this often results in fracturing the delicately constructed expansible member, or at least in so straining its parts as to render it necessary to correct the device. To overcome this, I provide a simple means for limiting the movement of the expansible member in either direction, and this is preferably acomplished by forming on the post G an inwardly projecting extension M which is interiorly threaded to receive a valve stem N. The latter carries a valve O which embodies inner and outer yieldable faces P that coöperate with a pair of valve seats in the passage C so as to cut off the pressure supply. The lower face of the sleeve E constitutes one of the valve seats with which the valve O coöperates, while a threaded sleeve Q is provided, and may be adjustably arranged within the passage C, its inner end coöperating with the outer face of the valve so as to close the passage when the valve stem is moved outwardly, due to a sudden suction. The valve stem N and the sleeve Q are provided with slots R at the ends thereof to receive a suitable tool by which they can be adjusted.

In the operation of the device, pressure entering through the passage C, with the parts in the normal positions shown, passes inwardly around the valve O, thence around the valve stem N to the interior of the expansible member F. This causes the post G to move inwardly and thereby operate the indicator to show the amount of pressure that is acting. In case of an unusual or abnormal pressure, when the valve stem is moved inwardly far enough to bring the inner face of the valve O into contact with the

valve seat, the passage is closed and pressure cut off. A similar operation takes place in case of an excessive suction, which causes the valve stem to move outwardly and close the passage by bringing the outer face of the valve O into engagement with the inner end of the sleeve Q. The position of the valve and of the sleeve D can be adjusted to set the instrument for a standard operation and so that it may operate safely within the determined limits. In case of any tendency to move the parts of the expansible member beyond such limits, it is prevented by cutting off the communicating passage and thus insuring the protection of the expansible member under all conditions. The device is of simple construction, and can be readily manufactured and assembled and presents an extremely unique method of accomplishing a much needed want in this art.

I claim as my invention:

In a sphygmomanometer including a hollow diaphragm connected at one side to an inlet passage and at its other side to indicating mechanism controlled thereby, means for preventing breakage of the diaphragm due to excessive pressure changes consisting of oppositely disposed valve seats arranged in said inlet passage, a valve movable in opposite directions between and coöperating with said valve seats, a valve stem carrying the valve, and a post carried by one side of the diaphragm and having an extension projecting through the diaphragm toward the inlet opening and forming a support for said valve stem.

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Witnesses:
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