

UNITED STATES PATENT OFFICE.

OSBORNE H. SHEPPARD, OF CHICAGO, ILLINOIS.

STETHOSCOPE.

SPECIFICATION forming part of Letters Patent No. 563,421, dated July 7, 1896.

Application filed February 15, 1896. Serial No. 579,347. (No model.)

To all whom it may concern:

Be it known that I, OSBORNE H. SHEPPARD, of Chicago, Cook county, State of Illinois, have invented certain new and useful Improvements in Stethoscopes, of which the following is a specification.

The present invention relates to a binaural stethoscope which I provide with certain novel features of construction, thus obtaining an instrument that is adjustable, very compact, and capable of being folded so as to be readily carried in a coat-pocket. The means of construction by which I attain these features are illustrated in the accompanying drawings, and will hereinafter be particularly described.

In the drawings, Figure 1 is a perspective view of an instrument containing the improvements referred to. Fig. 2 is a plan view of the stethoscope viewed when in position for use, and Fig. 3 is a view of device when folded.

In the device illustrated in the drawings, A refers to the chest-piece, which is made of hard rubber and attached to the lower end of a tubular Y of metal. Connected to the tubes *a a* of the Y are pliable tubes B B, preferably made of soft rubber. Attached to the tubes B are metallic hollow arms C C. The arms C C are curvilinear in form with their outer ends approaching each other, as shown. These ends have ear-pieces *c c*.

The features of the instrument so far described are to be found commonly in stethoscopes of the same class, and the parts referred to may be constructed in any well-known manner. The following relates more particularly to my invention:

Attached to the lower portion *c'* of the arms C C are inward-projecting spring-arms D D. These springs, which are preferably curved, are pivotally connected at *d*, thus forming a transverse spring connection X between the arms C C, which tends to bring the ear-pieces together and hold them in position when placed in the ears.

The leaves or sections D D, forming the transverse connection X, are rigidly attached to the hollow arms C C at *c'*, and the flat portions of the said connection which form the pivotal joint *d* occupy a horizontal plane when the instrument is in an upright position. The

axis of the joint *d* is longitudinal with that of the instrument as a whole. In other words, if the instrument is held vertically the axis referred to will be perpendicular. This feature of my invention is important. The ear-pieces not only are permitted to be adjusted laterally, but the arms holding them may be adjusted radially from a common axis, which is longitudinal with the instrument so that the ear-pieces may be placed in a direct line with the auditory canals.

It has been found that the direction of the auditory canals vary in individuals. Referring to Fig. 2, Z indicates a horizontal transverse line through the head. The oblique dotted lines *z z* represent the directions of the canals. The angle of these lines is rarely the same in each individual. Heretofore the outer ends of the arms C C have been made so that the openings in the same would point approximately to the average direction of the canals, or a number of instruments were made with different auditory angles.

It will be seen that by providing the transverse connection X with a pivotal joint having an axis longitudinal with the instrument the arms C C of the instrument may be adjusted radially from said axis, so as to readily conform to different auditory angles as found in different persons. Thus when each ear-piece is placed in the external meatus of the ears the openings of the tubes are easily adjusted, so as always to be in the direction of the auditory canals, and as the spring X is made so as to afford a moderate but sufficient tension the instrument readily adapts itself to any shaped head and is easily kept in the ears. An upturned lip *d'* is formed on the joint *d*, so as to prevent the spring-arms D D from being turned open too far.

The longitudinal pivotal joint *d* and the use of pliable tubes B permit the instrument to be easily folded, as shown in Fig. 3, thus allowing the same to occupy a small compass or be carried in coat-pocket, if desired.

It will thus be seen that my invention provides a very compact, flexible, and durable instrument, which is quickly adjustable, thus affording a very desirable stethoscope for medical or scientific purposes.

What I claim is—

1. In a stethoscope, the arms C C provided

with ear-pieces *c c* and a transverse connection having a pivotal joint the axis of which is longitudinal with the instrument, substantially as set forth.

5 2. In a stethoscope, the arms *C C* having a transverse spring connection pivotally jointed at *d*, the axis of the said joint being longitudinal with the instrument, as set forth.

10 3. In a stethoscope, the hollow arms *C C* having ear-pieces and means for adjusting the said arms radially from a common axis which is longitudinal with the instrument, substantially as set forth.

15 4. In a stethoscope, the combination of the chest-piece *A*, the tubes *a a*, pliable tubes *B B* and the hollow arms *C C* having ear-pieces

and means for adjusting the said arms radially from a common axis which is longitudinal with the instrument, as set forth.

5. In a stethoscope, the arms *C C* provided with a transverse connection pivotally jointed at *d* with an axis that is longitudinal to the instrument, the said joint having a lip or stop *d*, as described. 20

In testimony whereof I have hereunto subscribed my hand this 11th day of February, 1896. 25

OSBORNE H. SHEPPARD.

In presence of—

J. B. HALPENNY,

JNO. S. RUSS.