April 13, 1954 A. W. FLEISCHER 2,675,087

STETHOSCOPE

Filed Nov. 1, 1950

Fig. 1

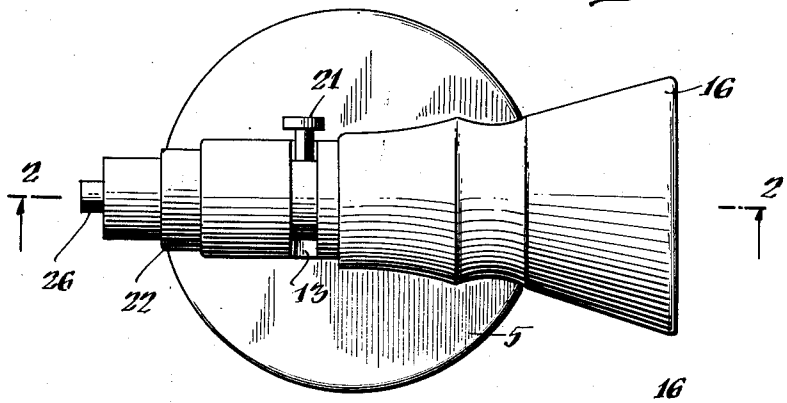


Fig. 2

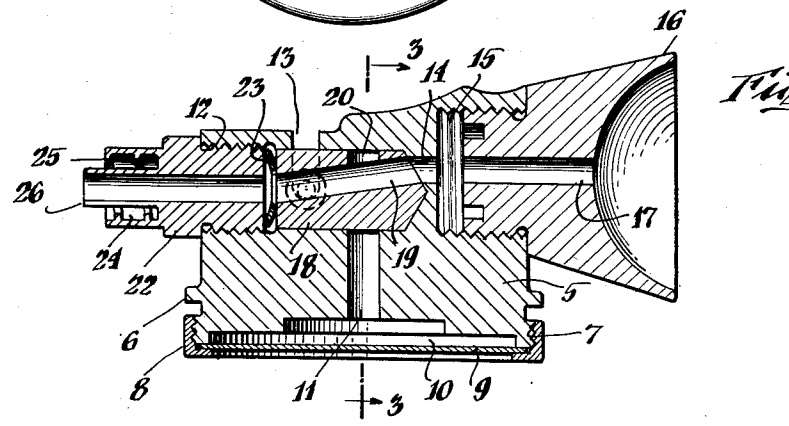


Fig. 3

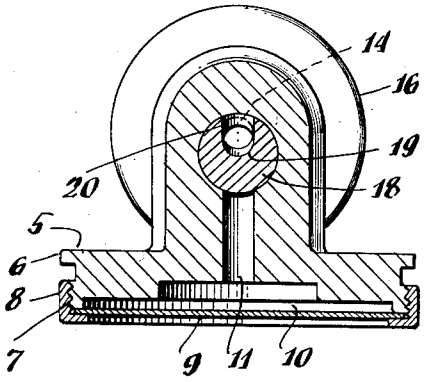
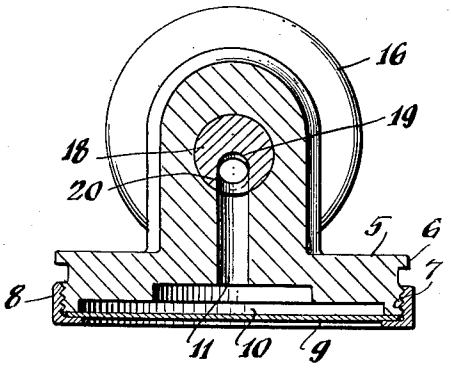


Fig. 4



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STETHOSCOPE

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9 Claims. (Cl. 181—24)

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This invention relates to a structurally and functionally improved stethoscope and especially the transmitter assembly thereof.

It is an object to provide a unit of this type which will combine both bell and diaphragm types of structure; the physician or other operator being capable of readily manipulating the parts so that the elected unit of the transmitter functions and continues operative until the parts are deliberately shifted or adjusted to place the second unit in operating condition.

Among other objects of the invention are those of furnishing a transmitter which will be capable of ready association with the tube or other parts of a stethoscope apparatus and which transmitter will embrace relatively few elements capable of ready manufacture and assembly to furnish a unitary and lightweight apparatus functioning over long periods of time with freedom from all difficulties.

With these and other objects in mind reference is had to the attached sheet of drawings illustrating one practical embodiment of the invention and in which:

Fig. 1 is a top plan view of the transmitter assembly;

Fig. 2 is a sectional side view thereof taken along the lines 2—2 and in the direction of the arrows as indicated in Fig 1;

Fig. 3 is a transverse sectional view taken along the lines 3—3 and in the direction of the arrows as indicated in Fig. 2; and

Fig. 4 is a view similar to Fig. 3 but showing the parts adjusted to a position different from that illustrated in the preceding figure.

In these views the numeral 5 indicates the body of the device which is conveniently formed of metal. The lower portion may be defined by a base flange 6 below which the body is threaded as at 7 to mount and retain a correspondingly threaded bezel ring 8. Clamped between this ring and edge portion of body 5 is a diaphragm 9. Above this diaphragm, body 5 is recessed as indicated at 10. Communicating with this recess is the lower end of a passage 11.

The upper end of passage 11 connects with a bore extending longitudinally of body 5. This bore is open at its rear end and preferably provided adjacent such end with threads 12. In advance of these threads, body 5 is formed with an arcuate slot 13 which may extend through substantially 180°. The forward end of the bore is defined by a wall having a preferably conical configuration. Extending through this wall and to one side of the center or apex thereof is a

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forward passage 14. The latter communicates at its outer end with a recess 15 formed in the forward face of body 5. This recess is preferably formed with threads so as to retain the rear end of a bell unit 16 therein. That unit is provided with the conventional passage 17 which will align with passage 14 when the parts are assembled.

Disposed within the longitudinally extending bore formed in body 5 is a valve or control member. The latter embraces a body 18 preferably formed of metal and having a forward conical face which corresponds in area and contour to the surfaces of the forward end wall of the bore. The control member is provided with a longitudinally extending passage 19 having its rear end centrally of body 18 and extending at an angle to the axis of that body so as to be capable of alignment with passage 14 when the parts have been shifted to a position such that communication is established between these passages. At a point short of its end the control or valve 18 is formed with a branch passage 20 extending from the outer face of element 18 in a direction preferably perpendicular to the axis of the latter and communicating at its inner end with passage 19.

In order to rotate control 18 with respect to body 5 a headed screw 21 may be utilized. The stem of the latter is threaded into a recess formed in the control. This stem extends outwardly through slot 13 to a point at which its head lies beyond the surface of body 5. It is apparent that when the parts are in the positions shown in Figs. 2 and 3 a continuous passage is provided from the outer end of bell 16 through to the rear end of control 18. Under these circumstances, passage 20 is not in communication with passage 11. When the control or valve 18 is shifted through 180° then the communication between passages 14 and 19 is interrupted with the parts being disposed in the positions shown in Fig. 4. Under these circumstances passage 20 will register and accordingly communicate with passage 11.

In order to secure the parts against displacement with respect to each other, a retainer in the form of a plug 22 has its forward end provided with threads which are engaged with threads 12 of the longitudinal bore. Interposed between this plug and the rear face of control 18 is a spring washer 23. The latter will yieldingly bear against the surfaces adjacent which it is disposed. As a consequence there will be no danger of objectionable play occurring between the parts. Additionally, control 18 will have its

forward tapered end thrust into frictional contact with the surfaces at the end of the bore. Therefore, the control will require deliberate manipulation for its rotation and will not accidentally shift. Adjacent its rear end plug **22** may terminate in a socket **24** formed with threads **25** and a central tubular projection **26**. The latter will provide a passage extending from passage **19** through the aperture of washer **23** and the body of retainer **22** such that the tube of the stethoscope will be in proper communication therewith. That tube may be secured in position by a coupling (not shown) which will engage with the threads **25**.

It is apparent that an apparatus as shown and described will furnish a lightweight, compact and desirable unit. The bell **16** is conveniently manufactured of plastic or other suitable material. All other parts are preferably formed of metal. Diaphragm **9** may be formed of plastic or any other suitable material. The several parts of the assembly may readily be detached for purposes of cleaning. The physician will have instantly available transmitters of both the bell and diaphragm types as part of the stethoscope assembly. He may readily adjust the parts so that either one of the units of the transmitter is, in effect, operative. So adjusted the parts will remain in proper positions until they are deliberately shifted.

Thus, among others, the several objects of the invention as specifically aforenoted are achieved. Obviously numerous changes in construction and rearrangement of the parts may be resorted to without departing from the spirit of the invention as defined by the claims.

I claim:

1. In a stethoscope assembly a transmitter including in combination a body presenting a base portion, an inner end and an outer end, said inner end being connectible to the tube of an assembly, mounting surfaces in the outer end and base portion of said body to respectively support bell and diaphragm types of sound transmitters, said body being formed with a bore extending longitudinally between its ends and passages providing communication from said bore to the base portion and outer body end, a control member rotatably enclosed within said bore and formed with axially and transversely extending passages communicating with each other, means for rotating said control member to establish connection between the axially extending passage thereof and the passage leading from said bore to the outer end of the body and alternatively between said axially extending passage, the transversely extending passage and the passage communicating with the base portion of said body and coupling means disposed within the bore adjacent the inner end of said body, said coupling means preventing a displacement of said control member from said bore.

2. In a stethoscope assembly a transmitter including in combination a body presenting a base portion, an inner end and an outer end, said inner end being connectible to the tube of an assembly, mounting surfaces in the outer end and base portion of said body to respectively support bell and diaphragm types of sound transmitters, said body being formed with a bore extending longitudinally between its ends and passages providing communication from said bore to the base portion and outer body end, a control member rotatably enclosed within said bore and formed with axially and transversely extending passages communicating with each other, means for rotating said control member to establish connection between the axially extending passage thereof and the passage leading from said bore to the outer end of the body and alternatively between said axially extending passage, the transversely extending passage and the passage communicating with the base portion of said body, coupling means disposed within the bore adjacent the inner end of said body, said coupling means preventing a displacement of said control member from said bore and friction means within said bore between said tube coupling means and said control member for restraining the latter against turning with respect to said body.

3. In a stethoscope assembly a transmitter including in combination a body presenting a base portion, an inner end and an outer end, said inner end being connectible to the tube of an assembly, mounting surfaces in the outer end and base portion of said body to respectively support bell and diaphragm types of sound transmitters, said body being formed with a bore extending longitudinally between its ends and passages providing communication from said bore to the base portion and outer body end, a control member rotatably enclosed within said bore and formed with axially and transversely extending passages communicating with each other, said body being formed with an arcuately extending slot and means connected to said control member and projecting through said slot whereby said control member may be rotated to establish connection between the axially extending passage thereof and the passage leading from said bore to the outer end of the body and alternatively between said axially extending passage, the transversely extending passage and the passage communicating with the base portion of said body.

4. In a stethoscope assembly a transmitter including in combination a body presenting a base portion, an inner end and an outer end, said inner end being connectible to the tube of an assembly, mounting surfaces in the outer end and base portion of said body to respectively support bell and diaphragm types of sound transmitters, said body being formed with a bore extending longitudinally between its ends and passages providing communication from said bore to the base portion and outer body end, a control member rotatably enclosed within said bore and formed with axially and transversely extending passages communicating with each other, means for rotating said control member to establish connection between the axially extending passage thereof and the passage leading from said bore to the outer end of the body and alternatively between said axially extending passage, the transversely extending passage and the passage communicating with the base portion of said body, said bore presenting an end surface adjacent the outer end of said body which embraces a curved contour, the adjacent end of said control member being similarly contoured and the latter surface engaging with said end surface of the bore.

5. In a stethoscope assembly a transmitter including in combination a body presenting a base portion, an inner end and an outer end, said inner end being connectible to the tube of an assembly, mounting surfaces in the outer end and base portion of said body to respectively support bell and diaphragm types of sound transmitters, said body being formed with a bore extending longitudinally between its ends and pas-

sages providing communication from said bore to the base portion and outer body end, a control member rotatably enclosed within said bore and formed with axially and transversely extending passages communicating with each other, means for rotating said control member to establish connection between the axially extending passage thereof and the passage leading from said bore to the outer end of the body and alternatively between said axially extending passage, the transversely extending passage and the passage communicating with the base portion of said body, that end of the bore which is adjacent the outer end of said body being formed with a conical surface and the adjacent end of said control member being similarly surfaced to engage with such bore surface.

6. In a stethoscope assembly a transmitter including in combination a body presenting a base portion, an inner end and an outer end, said inner end being connectible to the tube of an assembly, mounting surfaces in the outer end and base portion of said body to respectively support bell and diaphragm types of sound transmitters, said body being formed with a bore extending longitudinally between its ends and passages providing communication from said bore to the base portion and outer body end, a control member rotatably enclosed within said bore and formed with axially and transversely extending passages communicating with each other, means for rotating said control member to establish connection between the axially extending passage thereof and the passage leading from said bore to the outer end of the body and alternatively between said axially extending passage, the transversely extending passage and the passage communicating with the base portion of said body, that end of the bore which is adjacent the outer end of said body being formed with a conical surface, the adjacent end of said control member being similarly surfaced to engage with such bore surface and said axially extending passage having at least part of its length arranged at a tangent with respect to its axis whereby its outer end is disposed within the conical end surface of the control member to one side of the apex thereof, its opposite end being disposed substantially centrally in the opposite end of said control member.

7. In a transmitter a body formed with a longitudinally extending bore and recesses communicating with said bore, the body adjacent said recesses providing mounting surfaces for a bell type and a diaphragm type of sound receiving unit, a control member rotatably enclosed within said bore and being formed with axially and transversely extending passages communicating with said recesses and an element of a quick-detachable coupling mounted within and extending beyond said bore whereby the tube of a stethoscope assembly may be connected to said body in line with said bore.

8. In a transmitter a body formed with a longitudinally extending bore and recesses communicating with said bore, the body adjacent said recesses providing mounting surfaces for a bell type and a diaphragm type of sound receiving unit, a control member rotatably enclosed within said bore and being formed with axially and transversely extending passages communicating with said recesses, an element of a quick-detachable coupling mounted within and extending beyond said bore whereby the tube of a stethoscope assembly may be connected to said body in line with said bore, said body being formed with an arcuate slot and shifting means connected to said control member to extend through said slot to rock said member within the limits imposed by contact of said shifting means with the slot ends.

9. A stethoscope including in combination a body formed with a bore having outer and inner ends, means adjacent said outer end whereby a bell-type transmitter formed with a sound passage may be mounted by said body, means supported by said bore adjacent the inner bore end whereby a tube may be coupled to said body, a mounting adjacent the underside of said body for supporting a diaphragm type transmitter, said body being formed with a passage extending from said latter mounting to said bore at a point intermediate its ends, a control rotatably supported within said bore and formed with an axially and longitudinally extending passage centrally disposed with reference to the inner end of said bore whereby it is constantly in communication therewith, the outer end of said passage being offset to be alignable with the sound bell-type transmitter passage as said control is rotated, said control being formed with a radially extending passage communicating at its inner end with its longitudinal passage and alignable with the body passage and means for rotating said control around its longitudinal axis.

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