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A. H. PARCHER

2,292,237

OTOSCOPIC OR LIKE DEVICE

Filed Nov. 10, 1941

Fig. 1.

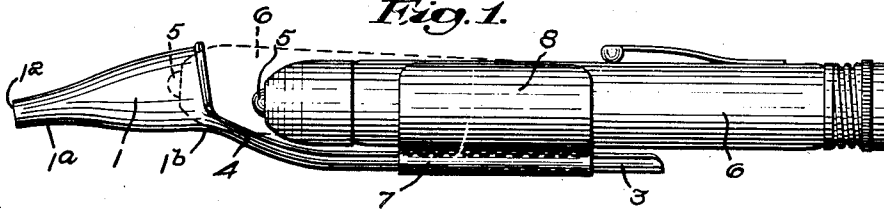


Fig. 2.

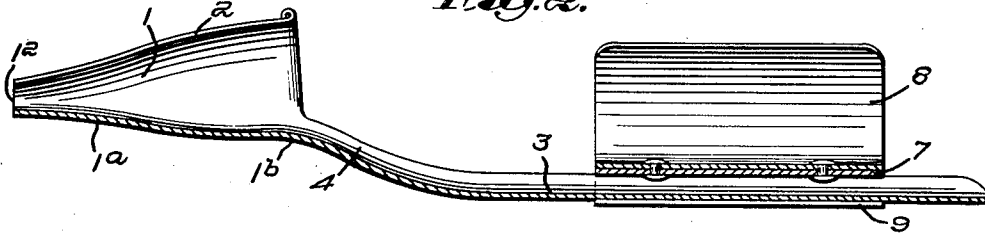


Fig. 3.

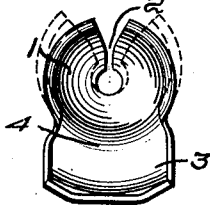


Fig. 4.

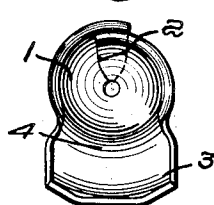


Fig. 5.

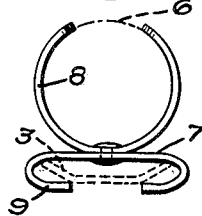
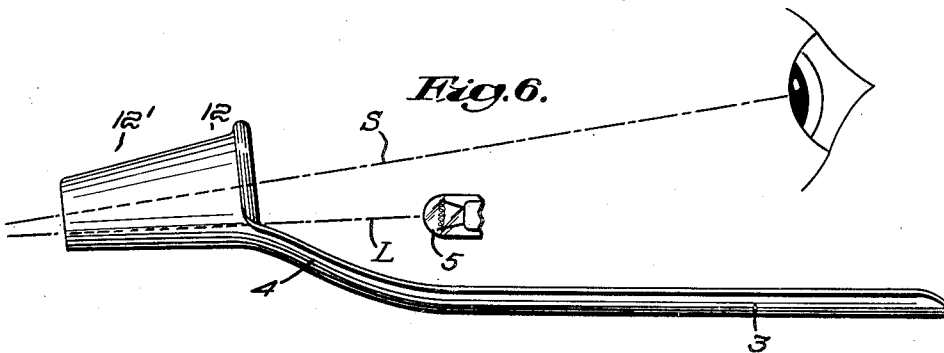


Fig. 6.



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UNITED STATES PATENT OFFICE

2,292,237

OTOSCOPIC OR LIKE DEVICE

Arthur H. Parcher, Ellsworth, Maine

Application November 10, 1941, Serial No. 418,544

1 Claim. (Cl. 128—9)

My present invention relates to improvements in small specula such as otoscopes or like devices usually carried by the practitioner in his pocket or bag.

Heretofore it has been proposed to use a small electric lamp fed by a dry cell battery as a source of illumination for the parts to be inspected or treated through the speculum, but it has been found difficult to provide this in a simple yet efficient instrument. By my invention a basis of adaptable and adjustable assembly of speculum with a pocket flashlight barrel is provided, capable of alternative combinations of different specula with the light source, and which is highly efficient though involving but a minimum in bulk.

According to my invention, I preferably use as a light source a small pocket searchlight of the type having a built-in lens tip which concentrates and focuses the rays in an extreme forward stream of light which is much stronger than that produced indirectly by means of reflectors. Reflection involves glare which interferes with vision. Attempts to avoid glare have heretofore been made by providing a non-reflecting or roughened surface on the inside of the speculum. While there will be some reflection of light within the speculum of my present invention, I avoid the greater part of this by disposing the speculum with reference to the axis of the light beam so that the beam, instead of striking the wall of the speculum and being reflected from side to side thereof, is directed over and substantially parallel to the lower side or floor of the speculum wall toward the small end of the speculum which is disposed over the area to be viewed or treated. By this means I avoid the interference with vision which usually accompanies glare, because the line of sight is always over the light source and preferably on the line of the axis of the speculum.

Specula of the class involved herein are usually of general conical design. In accordance with my invention the blade of the speculum which is designed for use to assemble the speculum and flashlight barrel, is bent or curved upwardly adjacent its juncture with the speculum to elevate the speculum so that the rays from the light will enter its larger end. To avoid the glare which would result from the light rays striking all walls of the inside of the speculum, I bend or depress the conical speculum downwardly at the point where the blade joins the speculum to an extent such that the light rays will travel just over its lower wall or floor. In other words, my conic specula are so positioned that their floors are substantially parallel to the longitudinal axis of the beam of light from the flashlight used.

With a speculum so positioned, its longitudinal axis is substantially in the axis of the desired sight line which thus is always above the light line so that there is no interception of these two lines until the two lines meet just outside of the small end of the speculum.

The extent of the upward bend of the speculum shank and the extent of the downward tip of the speculum at the point where the blade and speculum join is dependent somewhat upon the degree of conicity of the speculum, but this may be determined and fixed for standard manufacture so that focus of light and sight will be definitely assured at the smaller end of the speculum.

My invention provides suitable means for assembling the speculum with a flashlight to obtain a new combination basis of instrumentation. This may be effected through the medium of a holder having arms of resilient material to clamp the cylindrical barrel of the flashlight, which same holder also includes means for frictionally receiving the shank with which the speculum is provided. Such an assembly permits a longitudinal adjustment of speculum relative to holder, or of flashlight relative to holder. This longitudinal adjustment permits the bulb carrying end of the flash lamp, when the device is not in use, to be carried into the larger end of the speculum, which thus serves as a cap or guard for the lamp end of the lamp barrel. This is possible because the flashlight mount permits relative vertical adjustment and the longitudinal range of movement may be such that the end of the flashlight will enter the expanded end of the speculum from one-half to three-quarters inch, thus making the instrument shorter and more compact for carrying in the pocket. The barrel of the searchlight may be provided with the usual clip for attachment to the vest pocket of the user so that it may be readily available when the speculum is needed to be put in use.

Still further improvement resides in the structure of the speculum cone. Heretofore it has been the practice to make these items of professional use of brass or other non-resilient or substantially rigid stock. Separate or independent specula on such a basis of different forms and diameters for various uses have heretofore been provided but according to my invention such multiple equipment is rendered unnecessary on the simple basis of making my conical specula of light weight resilient metal or plastic. Preferably the speculum is pressed or shaped from one piece of material with a split longitudinally of the speculum wall opposite its floor or lower side so that it may be spread or overlapped to adapt it to larger or smaller canals or cavities into which it may be inserted during its use by the practitioner or other user.

As illustrative of my invention and as presenting simple practical embodiments thereof I have shown in the accompanying drawing forms well adapted to use in conformity with established professional technique.

In the drawing:

Fig. 1 is a side view of an aural speculum in accordance with my invention clamped to a conventional type of pocket flashlight positioned ap-

proximately as in use, its longitudinally adjusted position to the speculum being indicated in dotted lines.

Fig. 2 is a longitudinal section through the speculum and blade with the means for connecting the same to a flashlight mounted on the blade, but without the searchlight.

Fig. 3 is a rear end view of my new speculum, the walls being shown as in dotted lines, fully expanded.

Fig. 4 is a similar view of the same with specula cup contracted.

Fig. 5 is an end view of the adaptor or holder with flashlight and speculum shank indicated in dotted lines, and

Fig. 6 is a view partly in diagram illustrating the lines traversed by light and sight through the interior of the speculum to the point of focus at the smaller end thereof.

I have disclosed my invention herein as embodied in an aural speculum or otoscope of usual cone-like design as well illustrating its use in established professional technique according to my concept.

I provide a speculum 1 of conic design formed with a longitudinal slit or split 2. As my invention contemplates the use of light weight sheet metal or readily molded plastic rather than the brass of which such devices are usually made, it is possible to form or reform it from full, or say adult size, as indicated in Fig. 3 to small size adapted to the ear openings of children, as shown in Fig. 4.

The member 1 may be stamped from suitable flexible metal stock or may be die-molded from thermoplastic materials, such as synthetic resins.

I provide the speculum 1 with a slightly dished shank or blade 3 connected to the speculum by a bent neck 4 so that the shank lies below the lowermost portion 1a of the speculum wall. In order that this lowermost portion or floor 1a of the wall may lie substantially in the longitudinal axis of the light which is emitted through the projection lens 5 on the end of the searchlight 6 for the reasons set forth at length above, the speculum 1 is tipped downwardly by a slight bend at the point 1b where the shank neck 4 joins it. This bending results in the disposal of the lowermost portion of the speculum wall substantially horizontally parallel with reference to the shank 3 so that the light beam will travel just over the same in a straight line L from the lens 5 of the flashlight 6 to the smaller end 12 of the speculum which is directed against the area to be viewed or treated.

So positioned the longitudinal axis of the speculum is inclined with respect to the horizontal light line L and may more or less be coincident with the sight line S indicated in dotted lines in Fig. 6. The line of observation will substantially follow this axis 10 of the speculum so that there will be no interception of the two indicated lines L and S within the interior of the speculum and usually not until both reach a more or less common focus just beyond the smaller end of the speculum. Thus not only is glare obviated to a considerable degree, but the two indicated lines are independent so that there is a minimum liability for interference with vision.

Operably to connect a speculum with the flashlight to attain the above results, I provide a resilient adaptor or holder unit which includes a flattened portion 7 adapted to embrace the shank 3 of the speculum, and cylindrical portions or arms 8 disposed for engagement with a flashlight

casing. The speculum, holder and flashlight are longitudinally adjustable with respect to each other so that it is not only possible by adjustment to vary the intensity of the light delivered at the smaller end of the speculum, but the flashlight may be slid forwardly up over the portion 4 until the lens is entered within the larger end of the speculum which thus serves as a cap or shield as suggested in Fig. 1.

The combined shank 3 and flashlight 6 are of a size and shape convenient to be included in the operator's normal instrument grasp. As such flashlight provides for actuation by the same hand that holds the instrument assembly, the other hand of the operator is left free for use with other instruments or instrumentalities such as are normally used in any operation or treatment.

Preferably the shank is slightly dished as shown in Figs. 2, 5 and 6, the ends 9 of the portion 7 of the connecting means of Fig. 5 grip the shank 3 to provide a rigid frictional connection for it. The flashlight barrel is similarly rigidly gripped by the arms 8 of this connecting means. The length of the members 7 and 8 may be varied to give whatever stiffening factor may be desired.

While my improved specula members may each be modified to adapt it to use in larger or small cavities or passages, it will be understood that the holder or adaptor providing removable or detachable connection between the speculum and the searchlight, permits of the substitution in use of specula of different kinds and for different purposes with the regularly provided light source as may be found desirable or necessary. Thus the practitioner need carry but one searchlight which is readily combinable with the specula of different design or of different degrees of conicity or of different lengths. The specula shown in Figs. 1, 2 and 6 are shown of different design for the purpose of illustrating the versatility of devices instrumented according to my invention because all embody the distinguishing bends or curvatures between the shank and specula which permits of the passage of the beam of light through its interior with a minimum of reflection and without causing interference with vision along any desired line of sight through it.

What I therefore claim and desire to secure by Letters Patent is:

In an instrument of the class described, in combination, a speculum of substantially conic figure, including a thin elongated shank disposed horizontally below the plane of the speculum and connecting therewith by an upwardly extending neck, said speculum being secured to said shank in downwardly tipped relation at its juncture with said neck, whereby the floor of its wall lies relatively horizontally parallel above the plane of said shank, and cylindrical engaging arm portions for yieldably adjustably clamping the cylindrical barrel of a pocket flashlight having a lens in its end adapted to project a beam of light over said speculum wall floor, the longitudinal axis of said speculum when so positioned lying above the line traversed by said beam of light through said speculum and providing a sight line through said speculum independent of said light line until said two lines intercept at a point at the smaller end of said substantially conic speculum, said speculum having circumferentially deformable walls longitudinally slitted permissive of spread or overlap to adapt the speculum for use in larger or smaller cavities.

ARTHUR H. PARCHER.