(No Model.)

W. E. CLOUGH.

SPECULUM.

No. 475,975. Patented May 31, 1892.

Fig. 1.

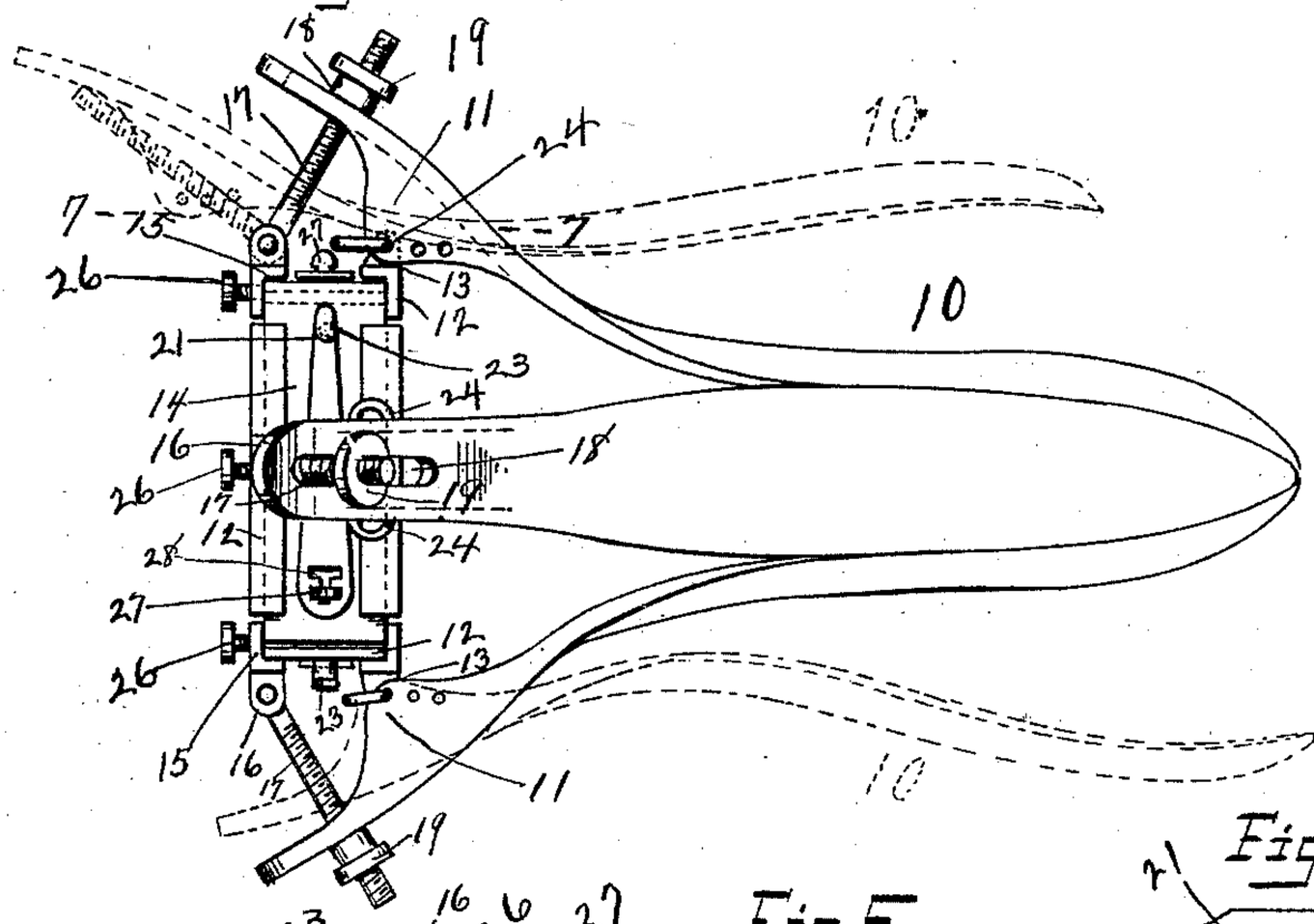


Fig. 2.

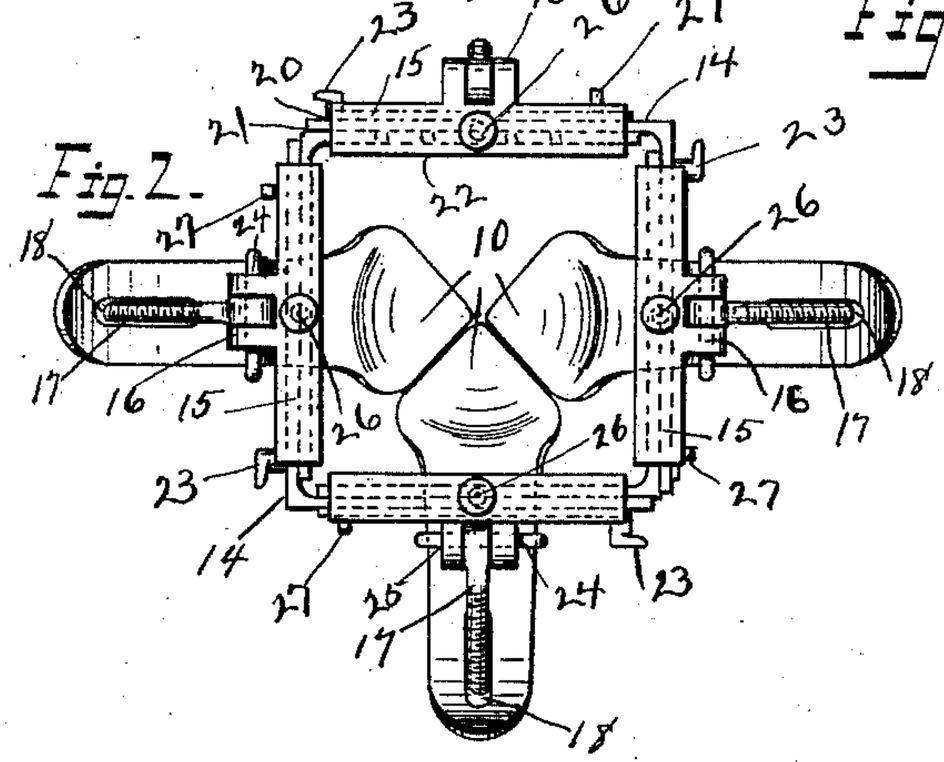


Fig. 5.

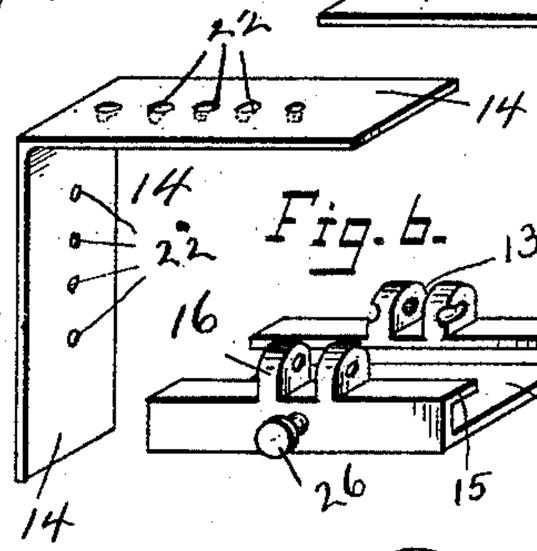


Fig. 4.

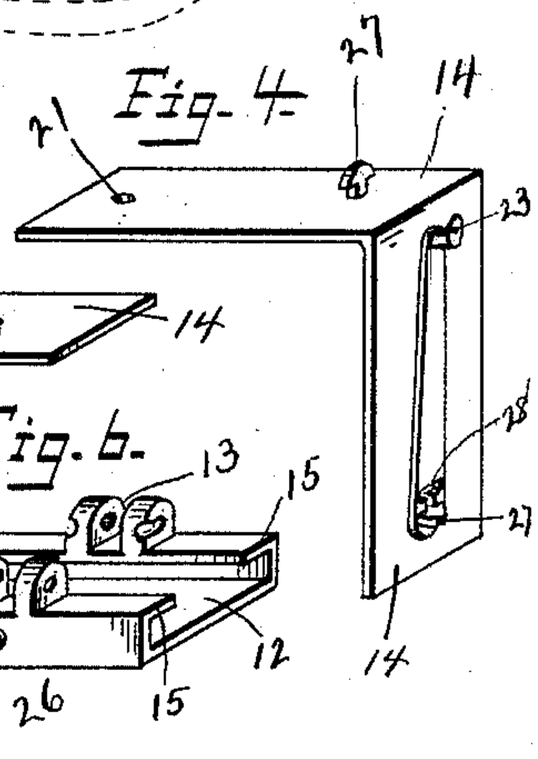


Fig. 6.

Fig. 7.

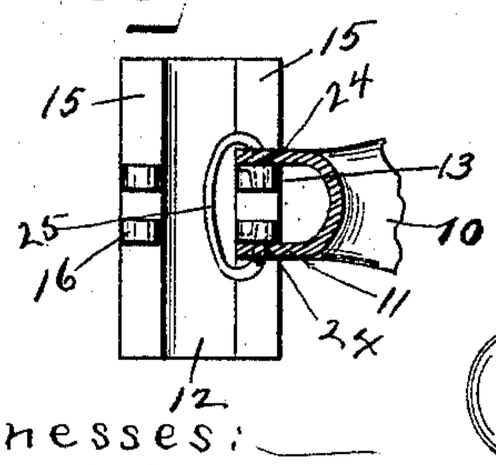
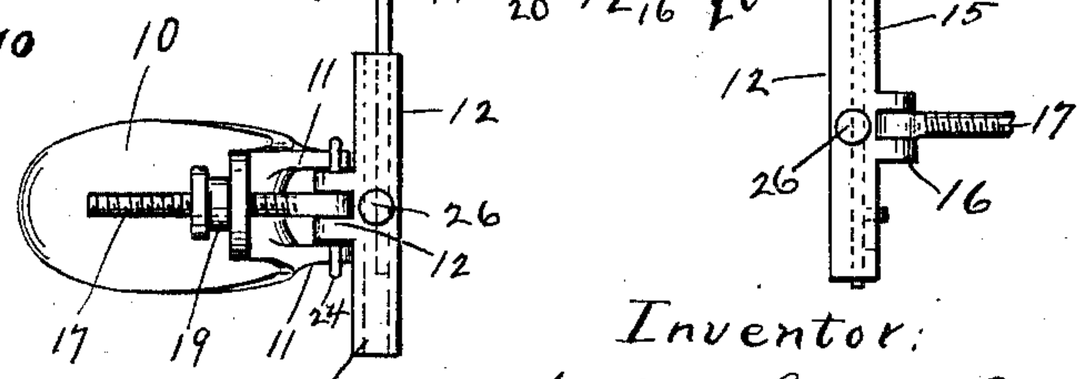


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM EUGENE CLOUGH, OF CINCINNATI, OHIO.

SPECULUM.

SPECIFICATION forming part of Letters Patent No. 475,975, dated May 31, 1892.

Application filed October 31, 1891. Serial No. 410,445. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EUGENE CLOUGH, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Speculums; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to speculums provided with removable valves, which are mounted pivotally and adjustably upon an expansible base; and the object is to construct an instrument of this kind in a novel manner, whereby greater strength and durability is attained and whereby its adjustability is increased to a larger degree than heretofore known in devices of this class.

Another object and new feature is to have the valve-supporting base so constructed as to be capable of sustaining itself after one of its sections has been removed to permit access to the mouth of the passage and to facilitate the introduction of instruments.

All of these objects are attained in the new construction, which is explained and pointed out in the following specification and claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the instrument as it appears before expansion, showing in dotted lines one valve expanded and another in the act of being removed rearwardly while the instrument is in position. Fig. 2 shows an end view of the instrument as it appears in Fig. 1, one of the valves removed. Fig. 3 shows in a similar view the instrument with its base and valves expanded and one section of the base-frame and one valve removed. Figs. 4, 5, and 6 show in perspective views one outer and one inner slide and one base-piece, the figure so placed one above the other as the parts would appear relatively to each other when put together and occupying their proper positions. Fig. 7 is a section on line 7 7 of Fig. 1, showing manner of connecting the valve to its respective base.

This newly-constructed speculum consists, substantially, of the valves 10, having bearings 11 by which they are secured and pivotally mounted upon bases 12 through the medium of lugs 13, projecting from the latter. These bases are adjustably connected to each other by angular slides 14, the limbs of which engage each with one of the contiguous bases 12 and are held in position thereon by overlapping flanges 15, forming parts of the said bases. The base-pieces and the slides, with their limbs, connecting all the former to each other, form thus a continuous frame on which the valves are supported. Opposite from lugs 13 on said bases are located other lugs 16 to which a screw 17 pivotally connects, reaching, also, through a slot 18 in the rear end of the valve supported on the same base. The outer end of this screw projects beyond the valve and carries a nut 19, by which the forward end of the valve may be raised or lowered, and by the adjustment of all the nuts the inserted part of the speculum may be expanded or contracted. The size of the entrance-opening to the interior of the speculum, respectively to the passage, is dependent on the size of the frame which supports the valves, and which frame, as already explained, is composed of the base-pieces 12 and the slides 14 connecting them. The size of this frame, respectively the clear opening between it, may be enlarged by pulling the base-pieces outwardly—that is, apart from each other—each base carrying its slides with it, the projecting limbs of the latter sliding out from within the adjacent base-pieces. To prevent collapse of the frame, a spring-actuated snap-catch 20 is provided on all the outer limbs of the slides, reaching through a hole 21 in these limbs and entering one of a number of holes 22 in the inner limb below it, thus holding the two contiguous limbs immovably on each other. Excepting the last one, one side of all the holes 22 in the inner limb is inclined, as shown in Figs. 2 and 5, so that when the frame is pulled apart the lower ends of the catches slide out of their holes unaided, thereby obviating the necessity of lifting them out and, as a final result, permit the frame to be expanded quickly. The last one of these holes is straight, however, so as to form a positive stop to prevent the operator from pulling in-

advertently the instrument completely apart at a time when such is not desired. To permit the frame to be collapsed is necessary to lift the snap-catch, which lifting is made convenient by the provision thereon of a button 23, the pressure of the distended organ against the expanded valves causing the frame to collapse as soon as the catch slides out of the inner hole it then occupies.

The removal of any of the valves is accomplished by detaching them from their supports 13 by removing their pivots 24, which pass through the said supports and through the valve-bearings 11. To cause these pivots to stay in their normal position and also to facilitate their removal, they are connected to each other or form the ends of a spring 25, the contracting pressure of which holds them in their position, but yields sufficiently to permit their withdrawal. The ends of these pivots may be rounded off on one side and the side of the hole through which they pass may be somewhat elongated, as shown in dotted lines in Fig. 7, to facilitate their dislocation from the holes. When it becomes desirable to remove one of the valves, their pivots are first pulled out by taking a hold of them through the medium of their connecting-spring 25, next the valve is pulled straight back into a position as shown in dotted lines in Fig. 1, finally the nut 19 is removed and the valve completely withdrawn, the screw passing out and clearing the latter through slot 18.

When only a limited area of the interior membrane is to be exposed for local treatment or inspection, the withdrawal of the valves may be foregone and the instrument so turned as to bring said area between the space of the spreading-valves. The same procedure may be resorted to when certain portions of the membrane are injured or too sensitive to stand the pressure of the valves bearing against them. This lateral space between the valves may also be adjusted or enlarged by moving them laterally with their bases on the extended limbs of the slides, as shown in Fig. 3. After adjustment in such positions the valves, with their bases, are secured by screws 26.

When it is necessary to expose portions of the passage near its orifice, or when more room is desired to admit instruments, one whole frame-section may be removed, the other sections, with their valves, holding the parts distended. (See Fig. 3.)

By having a number of additional holes in the bearings 11 of the valves their length, respectively the length of the whole instrument, may be made adjustable within certain limits.

By virtue of the great adjustability of this speculum passages may be dilated in any conceivable way, and thus made accessible in all their parts. They may be evenly dilated through their entire length, or either their interior or posterior part may be dilated independently, or by the lateral adjustment of the valves one side of the passage may be distended more than the other.

The manner of disjoining the instrument into its individual elements for the purpose of cleaning, inspection, repair, or replacement of parts is no doubt already apparent from the preceding explanation relating to the adjustment of the speculum. The valves are removed, as already explained. The frame is pulled apart as far as possible, like if it was to be expanded to its full limit. Snap-catch 20 is then lifted out of the last one of the holes in the inner or lower limbs of the slides, whereupon a complete disunion between slides and base-pieces takes place. To permit, also, a thorough cleaning of the snap-catch and the hole through which the same passes, the same is also arranged to be detachable. To admit of such removal, the end of the spring is secured to the slide either by a screw or by a button 27, as shown. The shank of this latter passes through a slot in the spring, which slot is widened at 28 to clear the head of the button. Ordinarily when the snap-catch is in its normal position within hole 21, the narrower part of the spring is kept in engagement with the shank of the button. When removal is desired, the snap is lifted out of its hole, whereby the end of the spring becomes free to permit it to be slid forward until the wide part 28 of the slot is below the head of the button, after which the whole spring is liberated and may be lifted off.

As shown, the supporting-frame of the valves consists of four sections, which form is to be preferred. It could, however, be constructed with three or more than four sections.

The instrument may be constructed in different sizes or modified shapes to make it applicable to different cases or conditions and also to permit its use in connection with the rectum.

Having described my invention, I claim as new—

1. In a speculum, the combination, with the valves thereof, of an expansible frame which supports them and upon which they are detachably mounted and means to expand the valves and to hold them in such expanded positions on their supporting-frame, this latter being composed of detachable sections so connected that two or more may be used alone and are capable of holding their position after the other frame-sections have been removed and provided with means to secure these sections to each other, all as substantially shown and described.

2. In a speculum, in combination, an expansible frame composed of sections, valves supported on said sections and laterally adjustable thereon, means to lock said sections on each other, and means to secure the valves in their adjusted positions on these sections, all as substantially shown and described.

3. In a speculum, the combination, with the valves thereof, of base-pieces upon which the

former are pivotally mounted, means to adjust and hold the valves on said base-pieces, and slides which connect and support the base-pieces, all as substantially shown and described.

4. In a speculum, the combination, with the valves thereof, of an expansible frame provided with lugs upon which the former are pivotally mounted, screws secured to this frame and passing through slots in the valves, and nuts on these screws by which the position of the valves is regulated, all as substantially shown and described.

5. In a speculum, the combination, with the valves thereof, of base-pieces provided with lugs 13, upon which the valves are mounted, screws secured to the base-pieces and adjustably connected to the valves, adjustable slides supporting the base-pieces, and means to lock the slides in their adjusted positions, all as substantially shown and described.

6. In a speculum, the combination, with the valves thereof, of a supporting-frame provided with lugs upon which the former are detachably mounted, and spring-pivots whereby the valves are held on said lugs, all as substantially shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM EUGENE CLOUGH.

Witnesses:
CARL SPENGEL,
SAMUEL M. QUINN.