

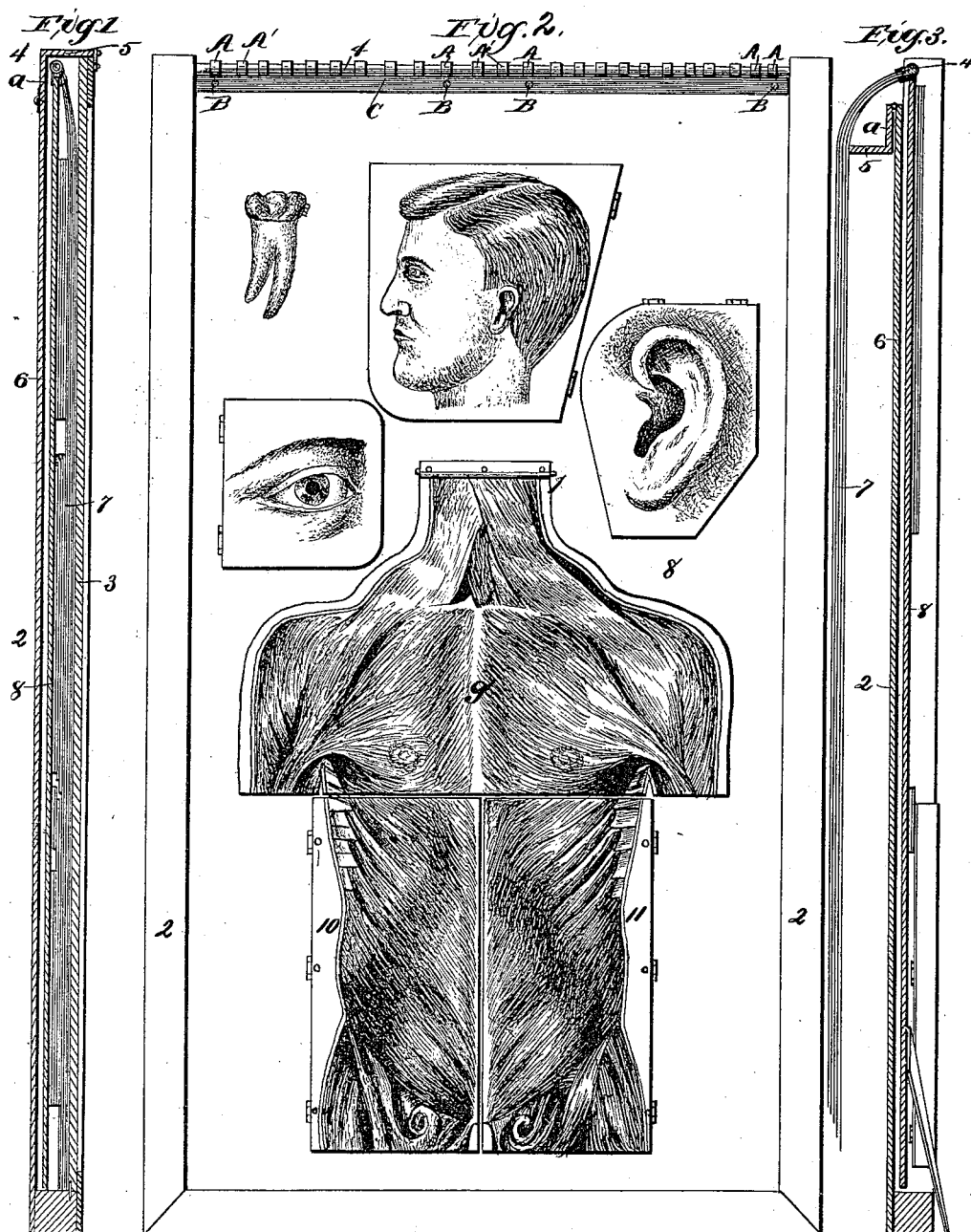
(No Model.)

5 Sheets—Sheet 1.

G. HENCKEL.  
ANATOMICAL CHART.

No. 421,833.

Patented Feb. 18, 1890.



Witnesses—  
Wm. Rheum.  
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Inventor  
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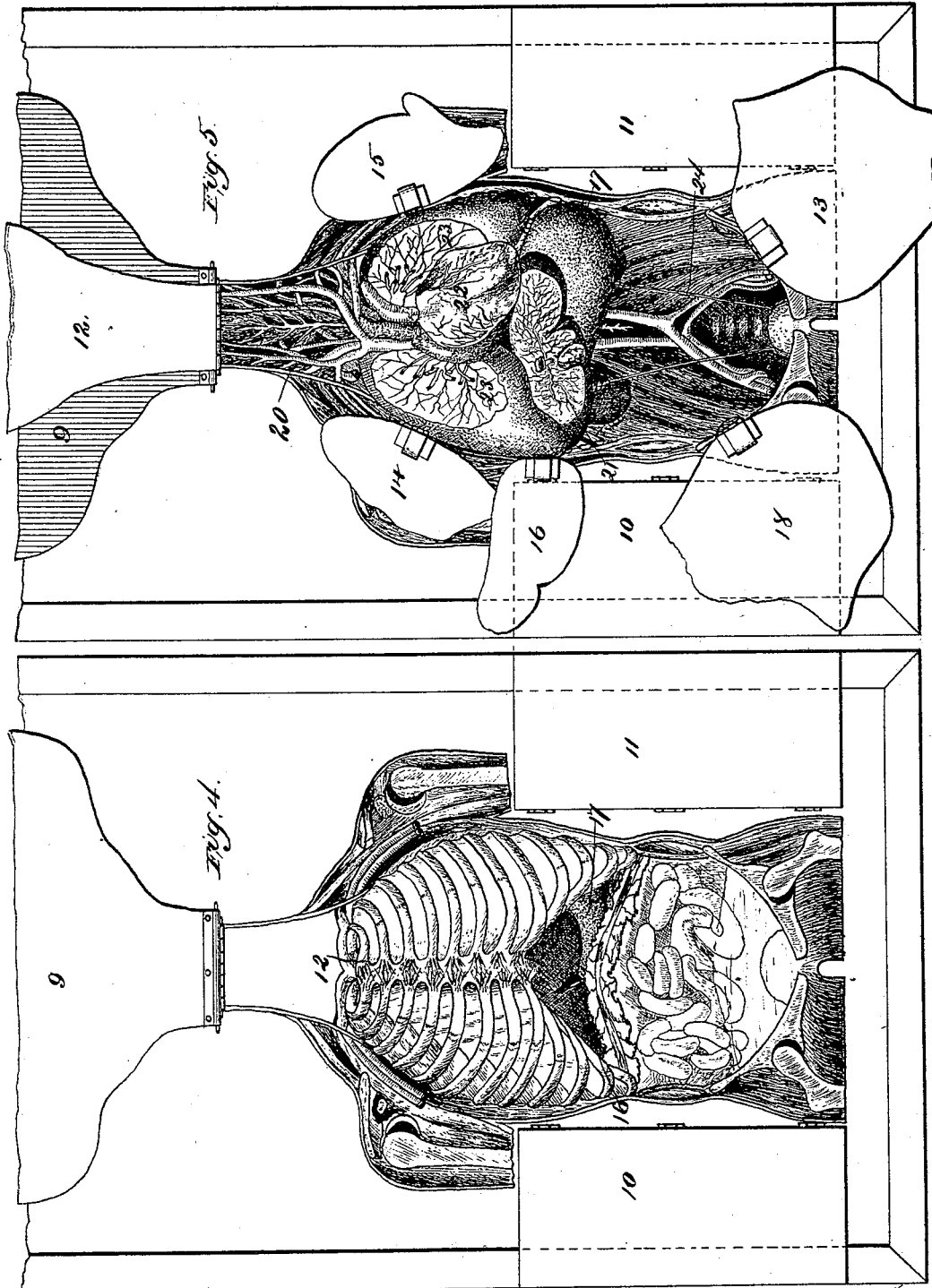
(No Model.)

5 Sheets—Sheet 2.

G. HENCKEL.  
ANATOMICAL CHART.

No. 421,833.

Patented Feb. 18, 1890.



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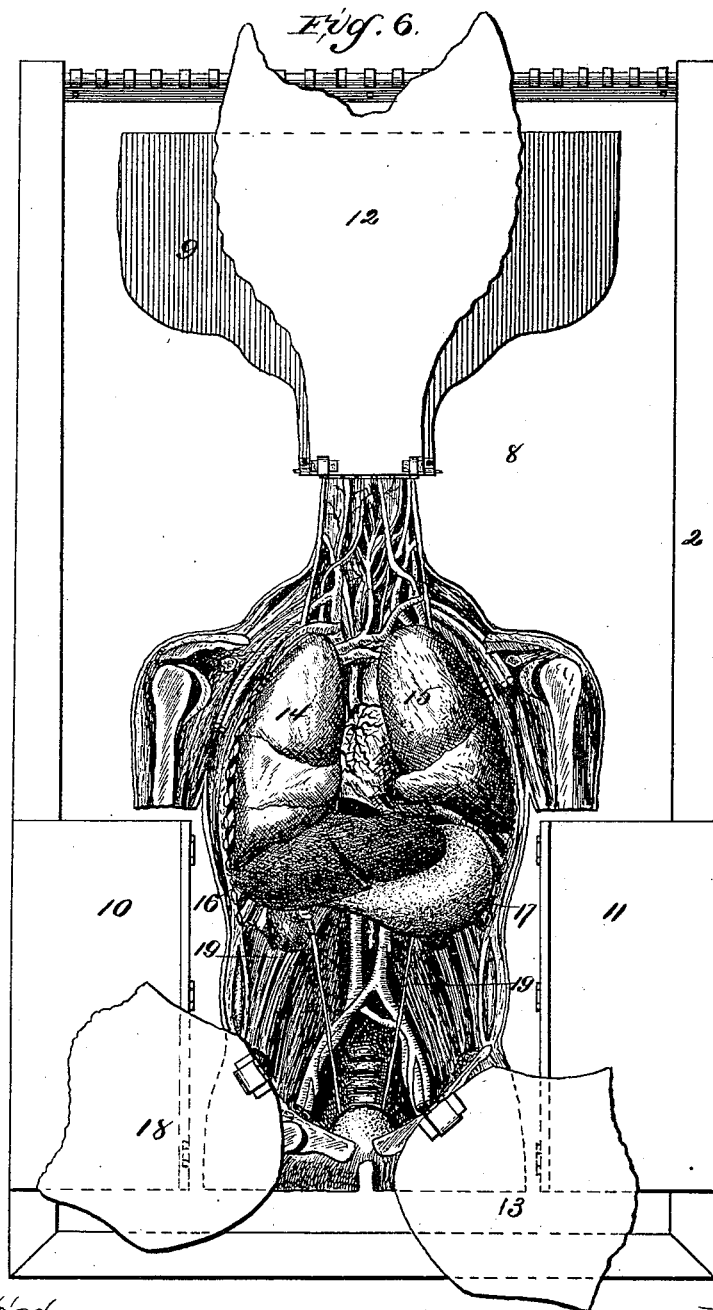
(No Model.)

5 Sheets—Sheet 3.

G. HENCKEL.  
ANATOMICAL CHART.

No. 421,833.

Patented Feb. 18, 1890.



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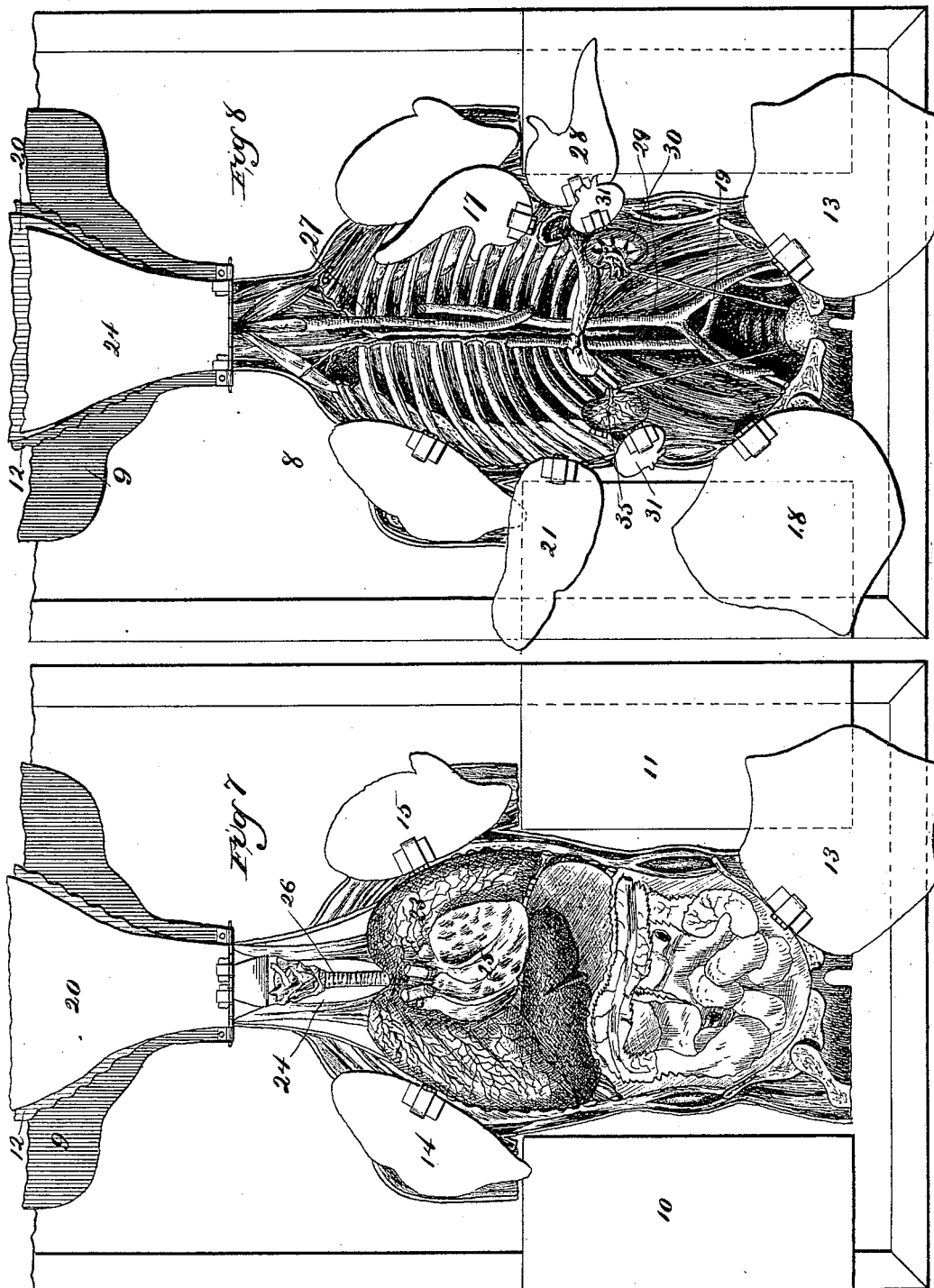
(No Model.)

5 Sheets—Sheet 4.

G. HENCKEL.  
ANATOMICAL CHART.

No. 421,833.

Patented Feb. 18, 1890.



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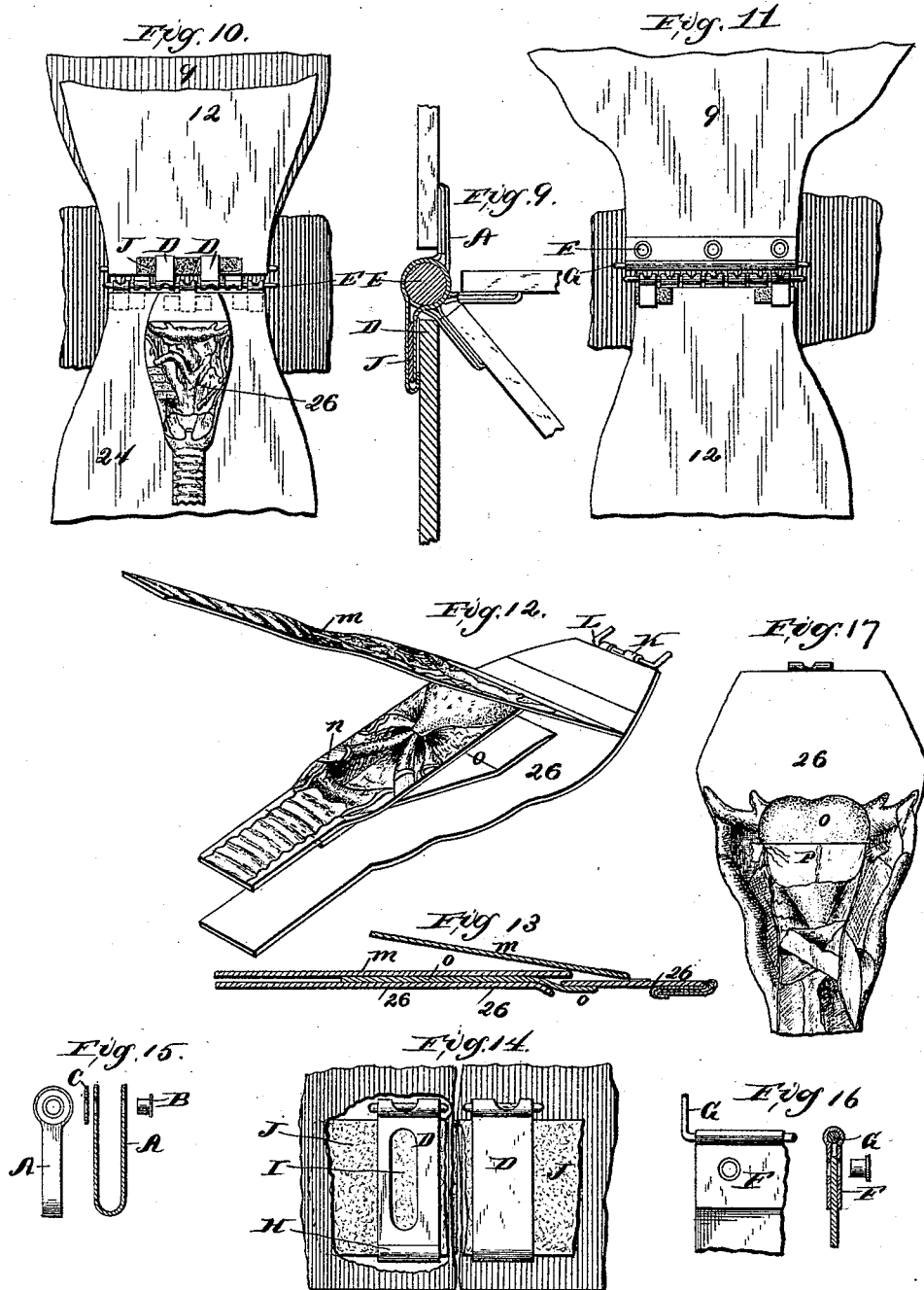
(No Model.)

5 Sheets—Sheet 5.

G. HENCKEL.  
ANATOMICAL CHART.

No. 421,833.

Patented Feb. 18, 1890.



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# UNITED STATES PATENT OFFICE.

GEORGE HENCKEL, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE CENTRAL SCHOOL SUPPLY HOUSE, OF ILLINOIS.

## ANATOMICAL CHART.

SPECIFICATION forming part of Letters Patent No. 421,833, dated February 18, 1890.

Application filed June 24, 1889. Serial No. 315,362. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE HENCKEL, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Mounting Anatomical Charts, of which the following is a specification.

The object of my invention is to facilitate the study of the anatomy of the human body and to increase the durability of the charts themselves by an improved arrangement of parts and by improved devices for attaching and protecting the several sheets of the charts, said devices being so constructed as to offer facilities for arranging and hinging the superposed sheets in the manner best calculated to assist the student in his work.

My invention consists in the parts and combinations hereinafter described and claimed. In the accompanying drawings, Figure 1 is a section of the chart and its inclosing-case. Fig. 2 is a front view of the case, some of the sheets being turned back to expose the foundation-sheet; and Fig. 3 is a section showing the case open, as in Fig. 1. Figs. 4 to 8, inclusive, show the chart with the sheets in various positions illustrative of their superposition and general arrangement. Figs. 9 to 17, inclusive, show constructive details, which will be hereinafter specifically described.

The case 2, Figs. 1, 2, and 3, is a shallow box having a removable cover 3. A rod 4 extends within the case across its top, and to this rod are hinged the large sheets that make up the chart. In order to permit the sheets to turn back without breaking, the top 5 of the case and a part *a* of the back 6, extending to a point below the rod 4, are hinged so as to turn back, as shown in Fig. 3. The hinging devices by which any number of sheets that are necessary for illustrating the subject may be attached conveniently will be described hereinafter. The outer large sheets 7 (shown turned back in Fig. 3) may be varied in number and may contain such views of the body as are considered most suitable for the special purpose of the chart. The large sheet 8, however, besides having an anatomical representation thereon, forms a foundation for a

number of smaller sectional sheets, whose construction and arrangement appear in Fig. 2 and following figures.

As seen in Fig. 2, there are attached to foundation-sheet 8 secondary sheets representing the trunk of the human body, the head, eye, ear, and one of the teeth. Substantially the same hinging device is used for the secondary sheets representing the eye, ear, teeth, head, and trunk, and its construction is hereinafter described.

As seen in Fig. 2, the outer sheets 9, 10, and 11 represent the muscular system of the trunk of the body, the upper sheet 9 being hinged at its top, as shown, and the sheets 10 and 11 hinged on opposite sides. Upon turning the sheets 9, 10, and 11 back the view shown in Fig. 4 is disclosed, in which, the muscles being removed, the ribs are disclosed upon sheet 12 and the intestines upon sheet 13. The sheet 12 is hinged by its top, in the same manner as sheet 9, upon a pivot secured to the foundation-sheet 8, and upon turning it back, as seen in Fig. 6, the lungs 14 15, the liver 16, and the stomach 17 are disclosed in their proper places. In this figure the sheet 13, showing the intestines, and the sheet 18, showing a sectional view thereof, are turned back, so as to expose the ureters 19 and the adjacent organs. The sheet 18, showing the intestines in section, is shown in position in Fig. 7.

Fig. 5 shows the appearance of the chart upon the turning back of the sheets 14 and 15, so as to expose the sheet 20, which is hinged at its top to the same pivot as sheet 12. The sheet 20 contains a representation of the pericardium 22 of the arteries from the heart to the lungs 23, partially in section. In Fig. 5 is also shown a section of the liver upon sheet 21, sheet 16, which represents the exterior of the liver, being turned back. Upon turning back sheet 20 sheet 24, containing a representation of the heart 25 in section and showing a deeper section of the lungs 23, is revealed. Annexed to this sheet 24 is attached, in a manner hereinafter described, and more fully illustrated in Figs. 12, 13, and 17, a subsidiary sheet 26, contain-

ing a representation of the trachea and larynx. Upon turning up the sheet 24 the ribs 27 and adjacent parts lying back of the lungs are revealed, as seen in Fig. 8, these being depicted upon the foundation-sheet 8. In this Fig. 8 the sheet 21, containing a section of the liver, is turned back, and the sheets 17 and 28, showing the exterior and interior of the stomach, respectively, are also turned back, thus fully revealing the ribs and the arteries 29 in proximity to the spine and the kidneys 30. The drawings show the section of the kidneys, the small flaps 31, which show the exterior of the kidneys, being opened back. The pancreas 32, lying in proximity to the ribs and the kidneys, are likewise shown in Fig. 8.

It is of course to be understood that besides the parts named and described in detail the foundation-sheet 8 and the larger secondary sheets 9 12 20, &c., contain representations not only of the principal organs, but also of the smaller parts which would appear in a correct representation of the human system, but which need not be here described in detail.

In order to conveniently attach and arrange the sheets, as herein described, so as to produce a strong and serviceable but not clumsy or unduly bulky joint, I have devised the arrangement for hinging the sheets shown in Figs. 1 to 3 and 9 to 16, inclusive. In Figs. 1 to 3 is shown the manner of attaching the main sheets 7 and 8 to the rod 4, which extends across the top of the case. Straps A A surround the rod 4 and are attached to the sheets by means of rivets or eyelets B. In Fig. 15 the straps and eyelets forming the hinge, as just described, are shown on an enlarged scale and in detail. The fastening of the strap to the sheet by means of the eyelet B may be strengthened by using a washer C, Fig. 14. As each strap A can be made very narrow, a large number of sheets may be fastened to the same rod by using only a small number of straps for each sheet and attaching them at different points of their width—as, for example, the straps A A A A may be attached to one sheet, and the straps A' A' A' A' may be attached to another sheet, and so on. In like manner the secondary sheets 12, 20, and 24 are attached to the foundation-sheet by means of a number of strap-hinges, as D D, Figs. 9 to 11, attached to their respective sheets and having a common pivot E affixed to the foundation-sheet. The outer secondary sheet 9 has a separate hinge F, Fig. 11, extending across its entire width, and a separate pivot G, this being done in order to present a neater appearance when the sheets are turned down, as seen in Fig. 2, by covering up and protecting the hinges to the lower secondary sheets 12, 20, and 24. Fig. 16 represents this joint in detail.

For securing the strap-hinges D D to their respective sheets I prefer the devices shown in Figs. 9, 10, and 14. The hinges are formed

by folding a piece of flat sheet metal, as shown in said figures, the strap being first bent at a point slightly one side of the middle, as may be best seen in Fig. 14. The projecting end H, as seen at the left of Fig. 14, is then folded over the shorter end, so as to hold them together. A piece of cloth J or other fibrous material is inserted between the two parts of the strap-hinge, so that an adhesive surface is provided by which the hinge may be attached to the paper or cloth of which the sheets are composed. To increase the adhesive surface, the strap of the hinge where it comes in contact with the cloth is cut away, as shown at I, Fig. 14, so as to expose the cloth. The hinge as thus constructed has an advantage over flexible hinges made of cloth or other flexible material in that they are more durable and allow the sheets to stay in any position in which they may be placed without having a tendency to return to the position which they most commonly occupy. In Figs. 12, 13, and 17 is shown the small sheet 26, Fig. 7, which is attached by a single hinge K and pivot L to the foundation-sheet. The bent ends of pivot L are adapted to be stuck through the foundation-sheet and clinched therein. The pivots for the other sheets are fastened in like manner.

Attached to the sheet 26, and overlying each other in the manner shown, are the several flaps *m n o*, containing representations of the trachea and larynx. The latter is shown in both its open and closed condition.

Referring to Fig. 17, which is a view of the reverse or under side of Figs. 12 and 13, the sheet 26 is cut to admit the passing of the upper end of flap *o*, which represents the epiglottis in its natural erect position from the front to the back of sheet 26. The part *p* represents the epiglottis overlying the larynx as it does when food is passing the esophagus.

I claim—

1. The combination, in an anatomical chart, of a casing adapted to inclose the sheets of the chart, having a rod across the top to which the principal sheets are attached by means of strap-hinges, substantially as described, a foundation-sheet secured within the casing, and secondary sheets pivoted to said foundation-sheet and representing the internal structures.

2. The combination, with an anatomical chart, of a casing adapted to inclose the sheets of the chart, having a rod across the top to which the principal sheets are attached by means of strap-hinges, substantially as described, a foundation-sheet secured within the casing, and secondary sheets representing the internal structure of the human body pivoted to said foundation-sheet by means of an adhesive strap-hinge constructed by bending the non-adhesive flat metal which forms the hinge so as to partly inclose a strap of adhesive material, as shown and described.

3. The combination, in an anatomical chart,

of a foundation-sheet, a secondary sheet representing the internal structure of a portion of the human body, and a hinge joining said foundation and secondary sheets, consisting  
5 of a pivot secured to the foundation-sheet and a flat metal strap hinged upon said pivot and having a strap of adhesive material secured between the folded ends of said strap, as shown and described.

GEORGE HENCKEL.

Witnesses:

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