(No Model.)

2 Sheets—Sheet 1.

L. W. YAGGY.

ANATOMICAL CHART.

No. 340,270. Patented Apr. 20, 1886.

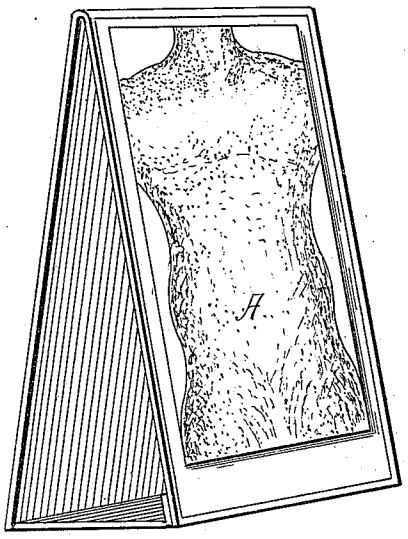


Fig 1

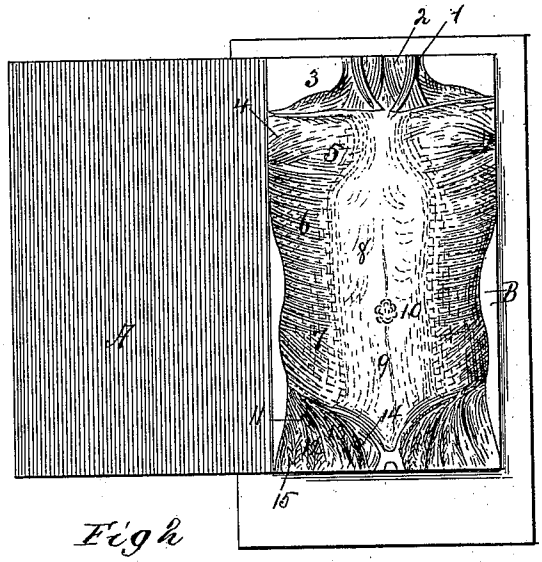


Fig 2

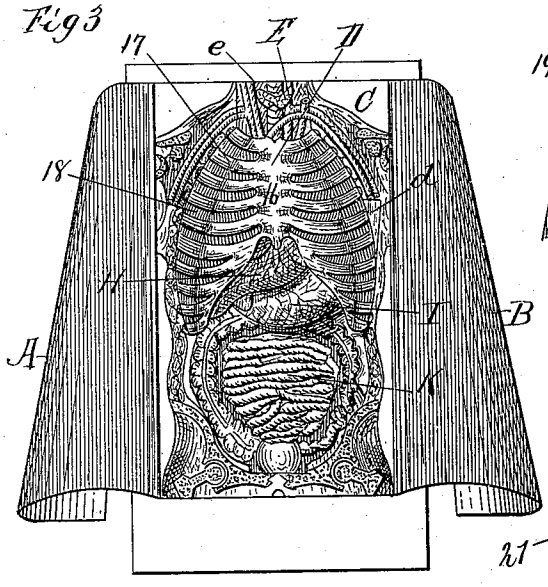


Fig 3

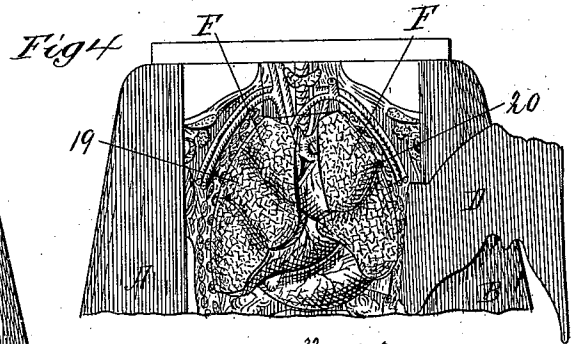


Fig 4

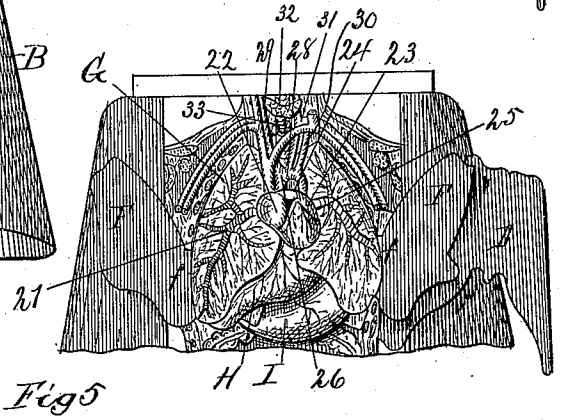


Fig 5

Witnesses
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N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

L. W. YAGGY.

ANATOMICAL CHART.

No. 340,270. Patented Apr. 20, 1886.

Fig 6

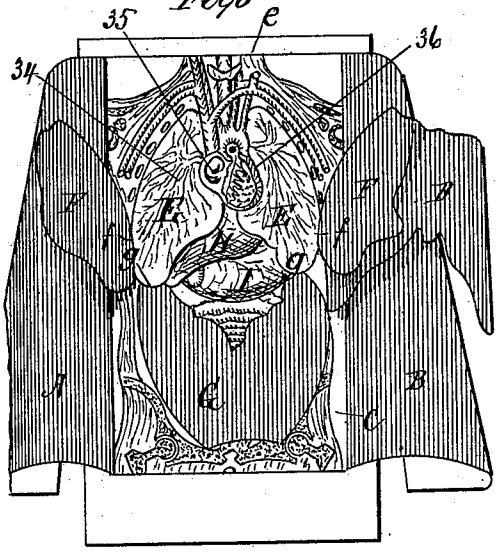
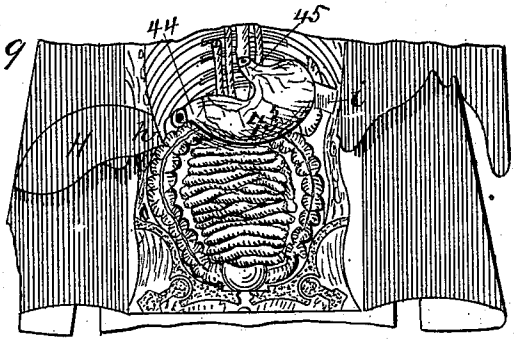


Fig 9



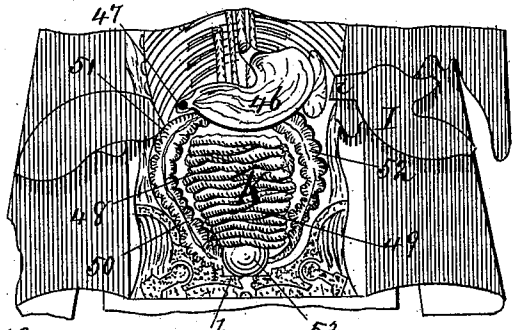


Fig 10

Fig 7

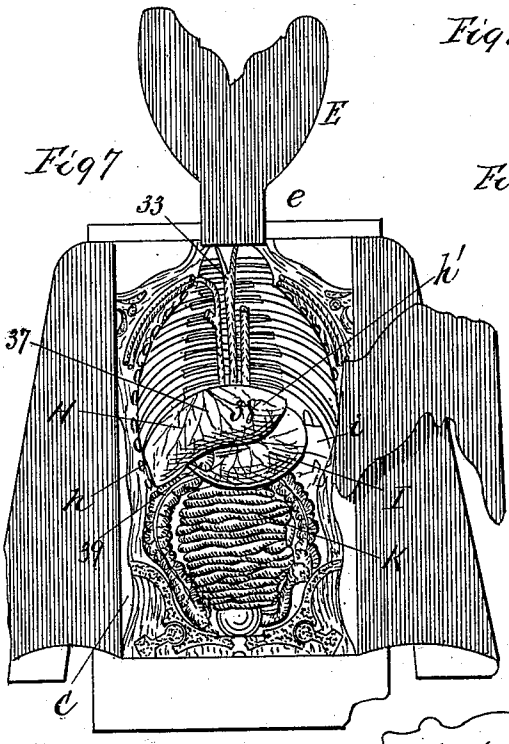
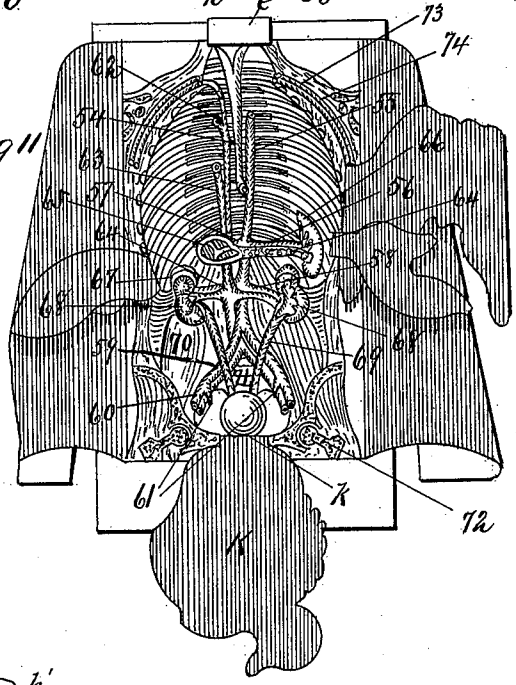


Fig 11



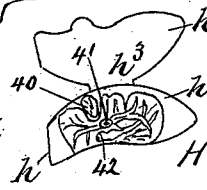


Fig 8.

Witnesses
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UNITED STATES PATENT OFFICE.

LEVI W. YAGGY, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN PUBLISHING HOUSE, LEVI W. YAGGY AND JAMES J. WEST PROPRIETORS, OF SAME PLACE.

ANATOMICAL CHART.

SPECIFICATION forming part of Letters Patent No. 340,270, dated April 20, 1886.

Application filed November 14, 1885. Serial No. 182,881. (No model.)

To all whom it may concern:

Be it known that I, LEVI W. YAGGY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Anatomical Charts, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a perspective view of my improved charts mounted upon a portfolio-stand; Fig. 2, a front elevation of the same with the first or outer sheet thrown back; Fig. 3, a similar view with the second sheet also thrown back; Fig. 4, a similar view of the upper portion of Fig. 3 with the hinged rib-section thrown back; Fig. 5, a view similar to Fig. 4, with hinged side flaps turned back, illustrating a section through the lungs; Fig. 6, a full elevation, the same as Fig. 5, with an additional hinged flap or section turned down, illustrating a second section through the lungs and heart; Fig. 7, a similar view with the entire lung and heart sections thrown up; Fig. 8, a detail elevation of the liver-section detached and shown in section; Fig. 9, an elevation of the lower part of the chart as shown in Fig. 7, with the liver section or flap turned outward; Fig. 10, a similar view with an additional flap turned outward to represent the stomach in section; and Fig. 11, a full front elevation with a flap or section representing the back portion of the stomach and the intestines turned down.

My invention relates to a system or series of charts for illustrating the anatomy of the human body.

The present improvement relates especially to the structure of the trunk or main portion of the body; and it consists, mainly, in a series of charts on separate sheets, illustrating different sections of the entire trunk, and in connection therewith subordinate or secondary sheets containing illustrations of the organs and sections thereof within the trunk, all attached by flexible joints or hinges to the main chart-sheet, whereby they may be turned outward successively, and so provide a graphic illustration of the anatomy of the trunk and organs contained therein, their structure and relative position.

I will proceed to describe in detail the construction and arrangement of these principal and secondary charts as I have carried out my invention practically in one form, and will then point out definitely in the claims the special improvements which I believe to be new and wish to protect by Letters Patent.

In the present application of my invention for the illustration of the anatomy of the trunk of the human body the primary parts are three separate charts on separate sheets, (indicated in the drawings by the letters A, B, and C.) The first sheet, A, contains a representation of a front view or elevation of the exterior of the trunk in natural condition. The second sheet, B, contains a similar view of the same with the cuticle removed, so as to show the muscular organization. The third sheet, C, contains a representation of the same portion of the body in section, the plane of the section being midway of the body and extending from side to side.

The sheets A and B are flexibly attached by one of their vertical edges to the sheet C, and preferably the attaching edges are arranged opposite to each other, so that the sheets are attached to opposite sides of the sheet C, and hence can be turned out in opposite directions, as shown in Fig. 3 of the drawings. This arrangement, however, is not absolutely necessary, as the two sheets A and B may be attached by corresponding edges to the same side of the sheet C, in which case they would be turned outward one over the other. The former arrangement is the more convenient, however, and hence I prefer it.

Between the two outer sheets, A and B, and the inner sheet, C, are several secondary and smaller sheets or flaps, which are designed to expose and illustrate the several internal organs of the body, and to show in a graphic manner their natural position and relation to each other. These secondary chart-sheets are preferably all attached by a flexible hinge or joint to the back sheet, C, so that they may be turned outward, or upward, or downward, as the case may be, for the purposes of illustration.

I will now proceed to describe these secondary charts. Directly underneath or back of the sheet B is a small flap or sectional sheet, D, which represents a front view of the thorax,

and is connected by a flexible hinge or joint, *d*, at one side to the sheet C. In the drawings it is shown attached to the right side of the latter, so that it may be turned outward to the right, as shown in Fig. 4 of the drawings. When this is done, the charts are intended to represent the removal of the front portion of the muscles and frame of the trunk, the section being made on a central line from side to side, as mentioned above. The turning outward of the sheet B and the secondary sheet or flap D is supposed to effect the removal of these parts. The internal organs of the body should be now exposed to view, and first in order at the front are the lungs and heart. These organs are represented on different sheets or flaps, which are all attached by flexible joints to one single flap or secondary sheet, E, the upper portion of which contains a representation of the trachea and surrounding muscles and parts, and is hinged at the neck by a flexible joint, *e*, to the upper portion of the sheet C, so that it may be thrown upward and backward. Immediately in front are two smaller flaps or sheets, F, which contain representations of the exterior of the right and left lung, and are hinged at their respective outer edges by flexible joints *f* to the flap or sheet E at the lower portion of its respective outer edges; but it is desirable to illustrate the interior structure of the lungs and heart. This is accomplished by turning outward the respective flaps F, which are supposed to remove the outer portion of the lungs, and then expose to view a second flap or sheet, G, which contains a representation of the exterior of the heart and a section of the lungs showing the bronchial tubes, thus illustrating the air-circulation through the lungs, as seen in Fig. 5 of the drawings. This sheet G is hinged at its lower edges—that is, at the lower points of the lungs—by flexible joints *g* to the sheet E, thereby permitting it to be turned down, as shown in Fig. 6 of the drawings. This exposes the main portion of the sheet E, which contains a representation of the heart in section and the lungs in section with the arteries and veins of the lungs, thus illustrating the circulation of the blood through the latter. The entire sheet E, with the subordinate flaps or sheets attached to it, may be thrown upward and backward upon its hinge, as shown in Fig. 7 of the drawings. The next organ back is the liver, which is represented on a separate flap or sheet, H, hinged by a flexible joint, *h*, at the left to the sheet C, so that it may be turned outward to the left side of the chart. This liver-sheet is composed of two parts or sections, an outer flap, h', and an inner flap, h^2, the two being connected together at their upper edges by a flexible hinge, h^3. The outer flap contains a representation of the exterior of the liver, and the inner flap a representation of a section of the same, which is exposed by turning up the outer flap, as shown in Fig. 8 of the drawings. When this liver-chart is turned outward upon its hinge, there is found next a small flap or sheet, I, which contains a representation of the exterior of the stomach, and is connected by a flexible hinge, *i*, to the right side of the sheet C, so that it may be thrown outward to the right, as shown in Fig. 10 of the drawings. Behind this last-named sheet is a larger one, K, which contains at its upper portion, that laid directly underneath or back of the flap I, a sectional view of the stomach, while the lower portion contains a general representation of the intestines and bladder. This sheet is hinged at its lower end by a flexible joint, *k*, to the lower portion of the sheet C, so that it may be turned downward, as shown in Fig. 11 of the drawings. When this last sheet is turned down as described, the base-sheet C is fully exposed, thereby revealing a full view of the rear section of the trunk, taken as already described, and showing the frame, muscles, and organs situated in the posterior part of the trunk, some of the parts being in section.

It is not necessary to describe more minutely the manipulations of these sectional charts, for their use must be obvious from the description.

It must be evident to any one familiar with the subject that my improvements afford a complete study of the anatomy of the human trunk, and in such form and arrangement that the several parts and organs may be shown together in their proper position and relation to each other, or may be studied separately and more or less in section.

For the purpose of indicating the several parts of the trunk and the several organs which are illustrated in the series of primary and secondary charts described above, I have indicated them by number in the several figures of the drawings, and will now mention in order the several parts as numbered in the drawings, and the designating-numeral for each part as found on the drawings.

1 indicates the sterno-cleido mastoid; 2, the sterno-tyroid; 3, the trapezius; 4, the deltoid; 5, the pectoralis major; 6, the serratus magnus; 7, the abdominal muscles; 8, the rectus abdominis; 9, the linea alba; 10, the umbilicus; 11, the tensor vaginæ femoris; 12, the rectus femoris; 13, the sartorius; 14, the pectineus; 15, the vastus externus; 16, the sternum; 17, the ribs; 18, the intercostal muscles; 19, the lobes of right lung; 20, the lobes of left lung; 21, the bronchial tubes; 22, the right auricle (heart;) 23, the right ventricle; 24, the left auricle; 25, the left ventricle; 26, the descending vena cava; 27, the ascending vena cava; 28, the arch of aorta; 29, the innominate artery; 30, the left subclavian artery (vertical section of heart and lungs;) 31, the left carotid artery; 32, the thyroid gland; 33, the trachea; 34, the pulmonary arteries and veins; 35, the cavity of right auricle; 36, the cavity of right ventricle; 37, the right lobe of liver; 38, the left lobe of liver; 39, the gall-bladder (liver under surface;) 40, the gall-bladder; 41, the vena porta; 42, the vena cava inferior; 43,

the stomach; 44, the pylorus; 45, the cardiac orifice; 46, the stomach (cavity;) 47, the duodenum; 48, the jejunum; 49, the ileum; 50, the ascending colon; 51, the transverse colon; 52, the descending colon; 53, the bladder; 54, the esophagus; 55, the thoracic aorta; 56, the splenic artery; 57, the hepatic artery; 58, the renal artery; 59, the common iliac; 60, the external iliac; 61, the internal iliac; 62, the azygos vein; 63, the ascending vena cava; 64, the renal veins; 65, the pancreas; 66, the spleen; 67, the supra renal capsule; 68, the kidney; 69, the ureter; 70, the psoas muscle; 71, the lumbar vertebræ; 72, the head of femur; 73, the axillary artery; 74, the axillary vein. It will be understood, of course, that the representations of the several primary and secondary charts are preferably colored, as is usual in anatomical charts, thereby making the illustrations more life-like and vivid, the aim being to obtain a coloring as near to nature as possible. The utility of this system of charts for use in schools and elsewhere must be evident. They not only present correct anatomical drawings or pictures of the several parts of the trunk and the contained organs, but they also present these representations in such shape as they may be removed from their natural positions, thereby enabling the student to obtain a correct idea of the structure and relative arrangement of the several parts, and in such a manner as to fix the information indelibly upon the mind.

The two outer sheets, A and B, are not entirely necessary to the remainder of the charts, and one or both may be dispensed with, though for a complete study they are desirable, but may be changed in their respective representation and may be increased in number, if desired.

The charts may be made of any size preferred, even up to life-size.

For convenience of illustration, I have shown these charts mounted upon a peculiar standard, L, to one side or portion of which the sheet C, which is the base of the system, is secured in any suitable manner, either permanently or temporarily, as desired. This standard is constructed to be used as a case or portfolio for the charts when folded up. I shall not describe it further here, as it constitutes the subject-matter of a separate application for patent, which I have already filed.

The portfolio-standard constitutes no part of the improvement in the charts, and the latter are not to be understood as limited in their use to this mode of mounting. They may be mounted in any other suitable way, or may be used unmounted, lying upon the table, or in any other way which may be found convenient.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The secondary sheet E, attached to the upper portion of the base-sheet C, in combination with the flap G, representing the exterior of the heart and the lungs in section, and flexibly connected to the sheet E at the lower edge thereof, substantially as and for the purposes set forth.

2. The secondary sheet E, flexibly attached to the base-sheet C, in combination with the flaps F and G, flexibly connected to the sheet E, the former at the respective side edges and the latter at the lower edge of said sheet E, and all containing the representations substantially as described.

3. The base-sectional chart-sheet C, in combination with the secondary sheet or flap H, representing the liver and flexibly attached to the said base-sheet by a separate joint at one edge thereof, whereby it may be turned outward independently, substantially as and for the purposes set forth.

4. The base chart-sheet C, in combination with the secondary sheet or flap H, composed of two parts or flaps containing exterior and sectional views of the liver flexibly hinged together at their lower edges, and one flexibly jointed to the base-sheet at its outer edge, substantially as and for the purposes set forth.

5. The base chart-sheet C, in combination with the secondary flap or sheet I, representing the exterior of the stomach, and connected by independent flexible joints to the base-sheet, whereby it may be turned outward independently, substantially as and for the purposes set forth.

6. The base chart-sheet C, in combination with the secondary flap or sheet K, representing the intestines and a sectional view of the stomach, and flexibly connected to the base-chart at the lower portion thereof, whereby it may be separately turned down, substantially as and for the purposes set forth.

7. In anatomical charts, a base-sheet, C, containing a sectional view of the trunk, in combination with the sheets A and B, containing front views of the same trunk, as described, and attached at opposite sides or edges to the sheet C, and independent secondary sheets representing the internal organs and flexibly and independently connected to said base-sheet, substantially as and for the purposes set forth.

8. In anatomical charts, the main sheets A, B, and C, in combination with the secondary sheets D, E, F, G, H, I, and K, all containing the representations and constructed, arranged, and operating substantially as and for the purposes set forth.

LEVI W. YAGGY.

Witnesses:
IRVINE MILLER,
C. FEIGEL.