No. 835,431. PATENTED NOV. 6, 1906.

H. A. HUGHES.

PROJECTOR FOR PATHOLOGICAL WORK.

APPLICATION FILED MAY 5, 1906.

Fig. 1.

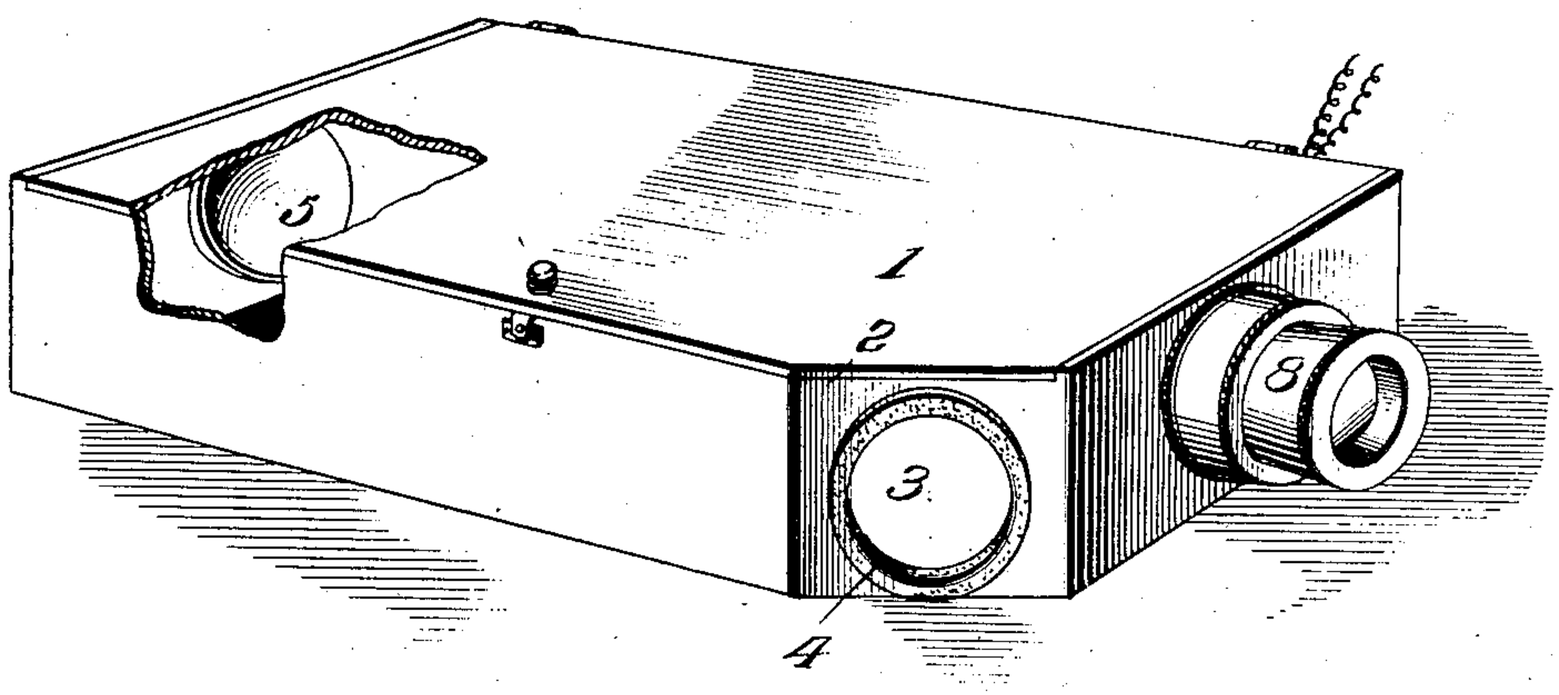


Fig. 2.

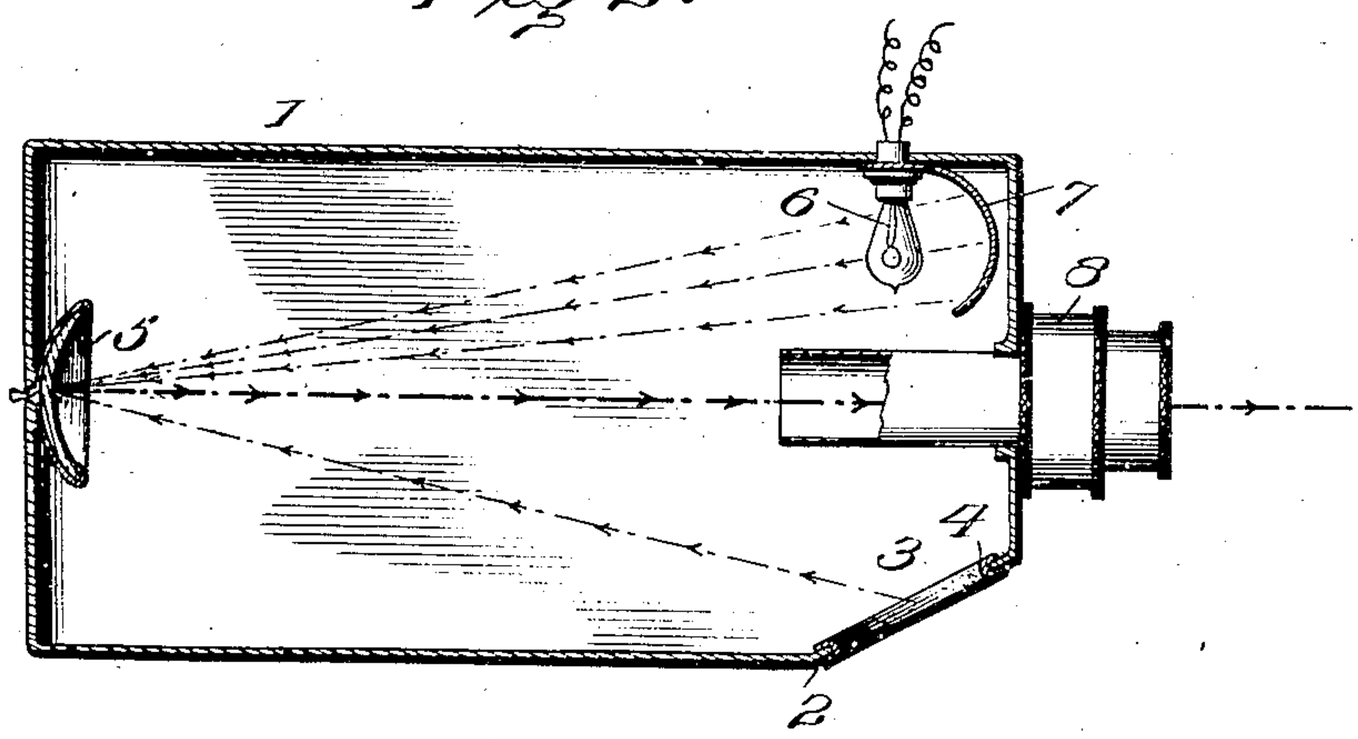
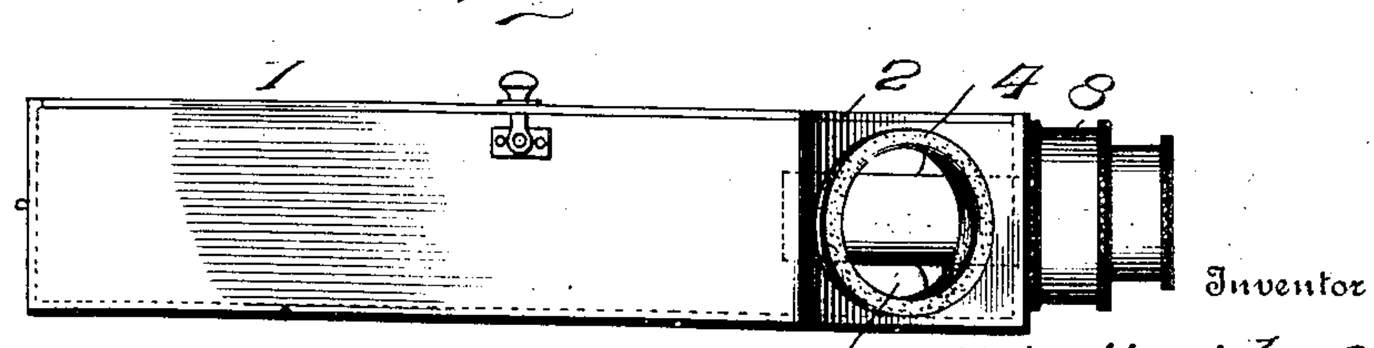


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

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PROJECTOR FOR PATHOLOGICAL WORK.

No. 835,431. Specification of Letters Patent. Patented Nov. 6, 1906.

Application filed May 5, 1906. Serial No. 315,431.

To all whom it may concern:

Be it known that I, HENRY A. HUGHES, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Projectors for Pathological Work, of which the following is a specification.

This invention relates to improvements in projectors used, primarily, for pathological work.

In demonstrating to a class the detail of a particular disease by means of pictures, charts, or the like considerable difficulty is experienced in holding the attention of the students because of the size of the pictures and the distance they are placed from the view-point. Owing to the size of the class, &c., it has been found impractical to demonstrate to a large class from a particular part of the body. Hence but a few enjoy the privilege.

According to my invention I propose to provide an apparatus whereby a particular portion of the human anatomy may be thrown upon a wall many times enlarged, which affords the whole class opportunity to observe the real condition, the enlargement being such as to enable them to note all the details as if making a microscopical examination direct from the part of the body under discussion.

While my invention has as its fundamental feature the furtherance of this particular science, it is not limited to this. For instance, I may expose a print, object of any description, or printed matter to the reflector and transfer it on an enlarged scale to the wall.

Other objects and advantages will be hereinafter referred to, and particularly pointed out in the claim.

In the drawings, Figure 1 is a perspective view of my improved apparatus. Fig. 2 is a horizontal sectional view of the same. Fig. 3 is a side elevation of the apparatus.

The numeral 1 indicates a box-like structure formed with an angularly-disposed portion 2, formed with an opening 3, surrounded by a felt lining 4. In rear of the structure 1 is a reflector 5, situated relative to the opening 3, whereby an object placed opposite said opening will appear precisely in the center of the reflector. Located at a convenient point in the box structure is a source of light 6, preferably electric, and a reflector 7 to reflect and focus the light in the center of the reflector 5. The light from the lamp 6 on the reflector 5 reflects the object in line with a lens 8, located in the front of the box structure. The lens is of such power that the representation of the object reflected in the reflector 5 will be many times enlarged on the wall or screen, as the case might be.

My invention is particularly adapted for use in a class-room where clinics are going on to demonstrate diseases of muscles, veins, or tissue structures. For instance, if the diseases of the eye should be the subject under discussion a diseased eye would be placed in the opening 3 and through the instrumentalities described would be thrown up in magnified form, thereby enabling the class or oculist to obtain a comprehensive view of the particular disease. So also with pictures, &c. In fact, any object placed in the opening will be reflected in magnified form to the wall.

Inasmuch as the reflector is of the looking-glass type, the colors and details are transferred in exact accord with the original, which is of the utmost importance when using the apparatus for class purposes.

Because of the well-recognized principle of transferring opaque pictures, &c., to a screen it is deemed unnecessary to specifically and elaborately discuss the various light-rays, focusing, &c., in this application. Sufficient to state that what I regard as novel in the apparatus as described are the specific features, such as the reflectors and lens, in combination with an opening by means of which an object may be transferred to the wall.

What I claim is—

In a projecting apparatus, a box-like structure having one of its edges angularly disposed with an opening therein, a yielding packing surrounding the opening, a pivoted deflector located within the box, a lens located in the front of the box in a straight line from the deflector, a source of light within the box situated between one side thereof and the lens, and a reflector adjacent the source of light to reflect the light at an angle to the first-mentioned reflector, the opening

in the angularly-disposed edge of the box and the first-mentioned reflector being so related as to be at an angle to each other whereby an object placed adjacent the opening will be thrown by the reflector and the rays of light thereon to the lens, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY A. HUGHES.

Witnesses:

ELIZABETH L. MACFATE,

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