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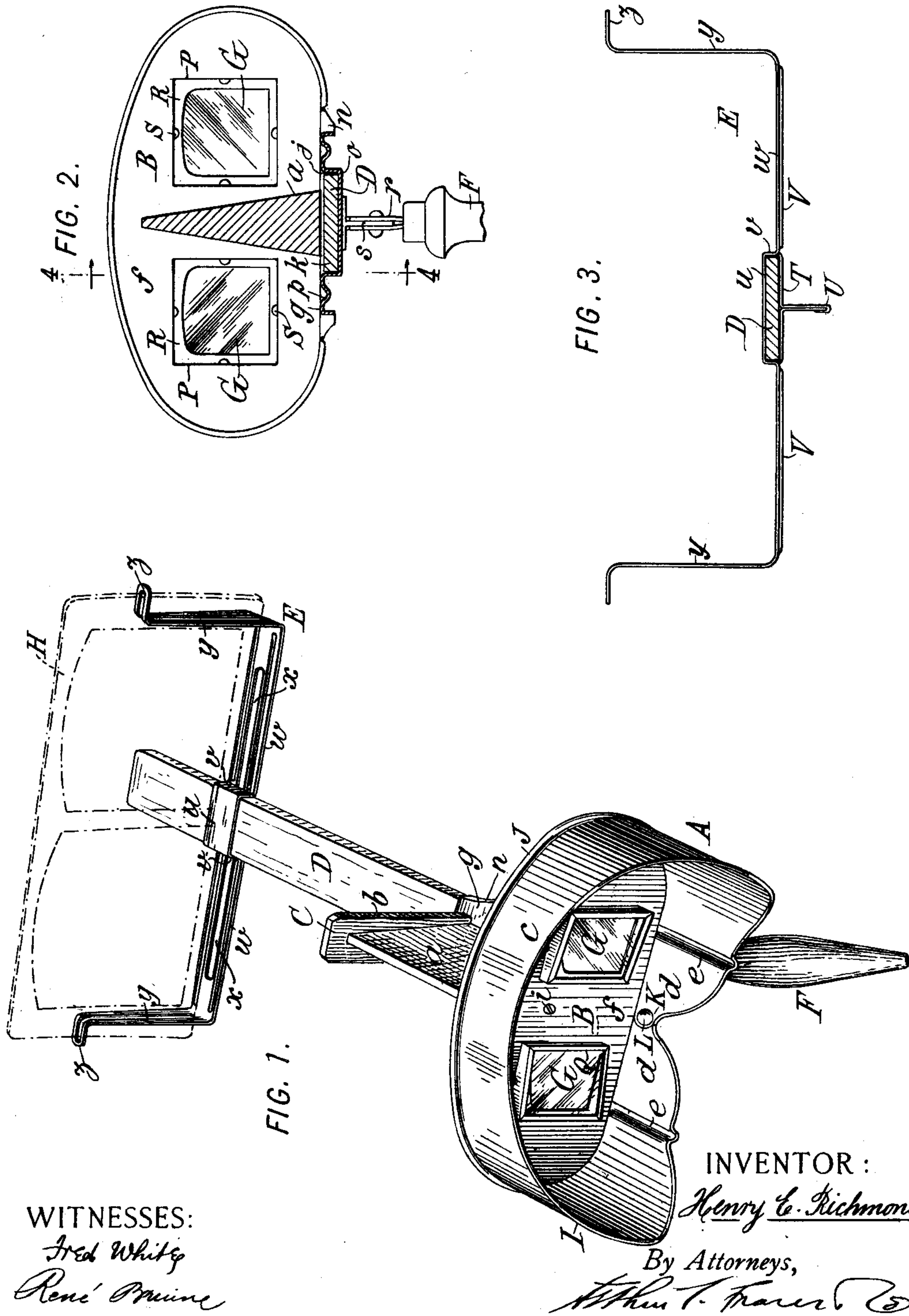
Patented June 11, 1901.

H. E. RICHMOND.
STEREOSCOPE OR SIMILAR DEVICE.

(Application filed Dec. 27, 1899.)

(No Model.)

3 Sheets—Sheet 1.



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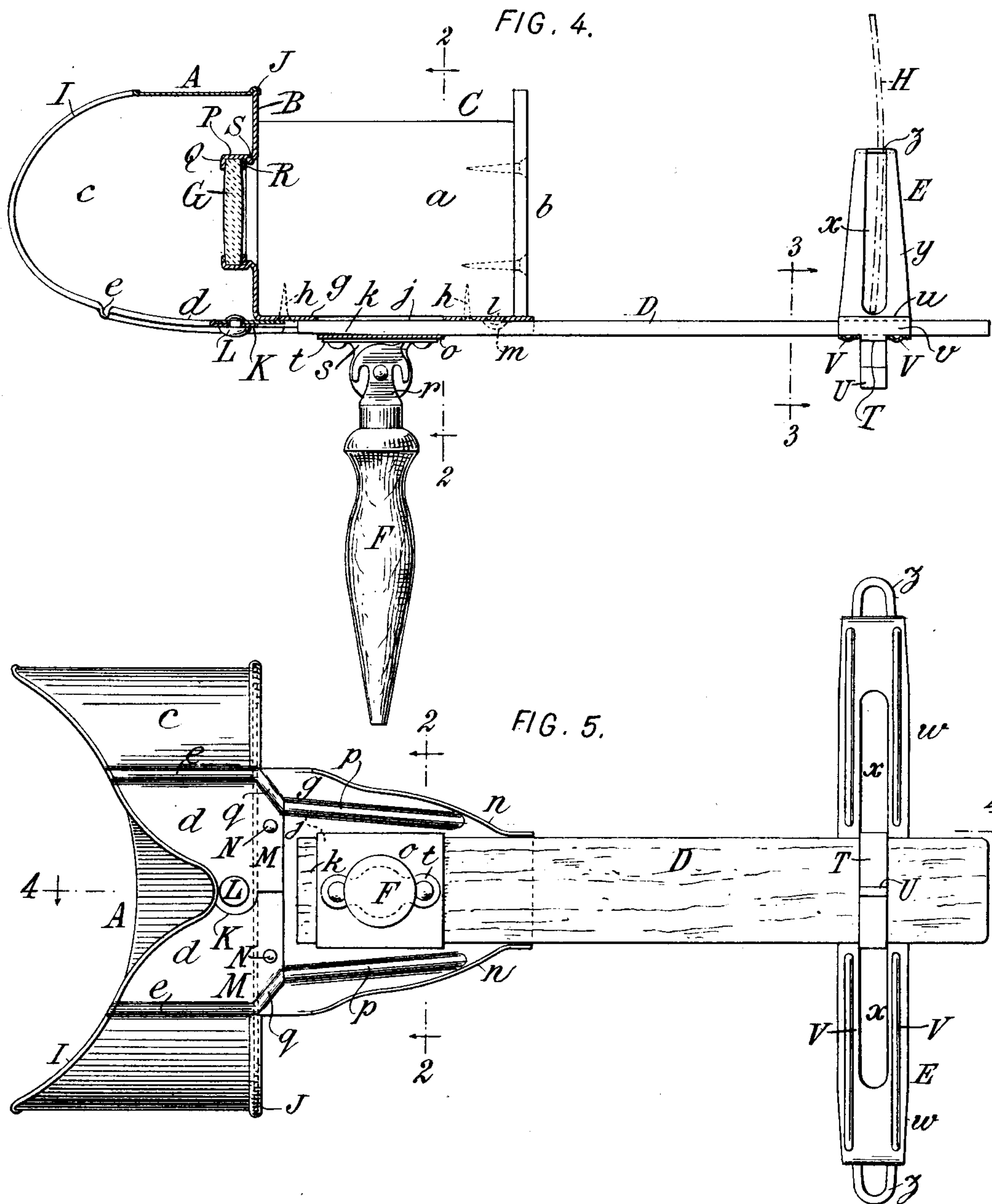
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3 Sheets—Sheet 2.



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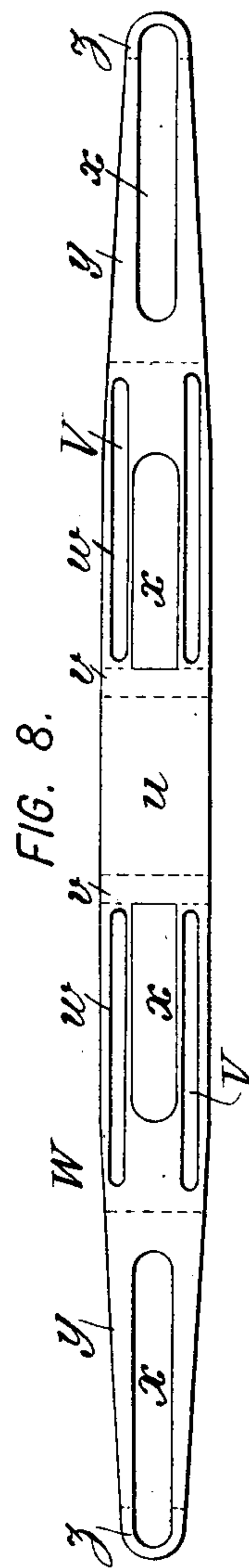
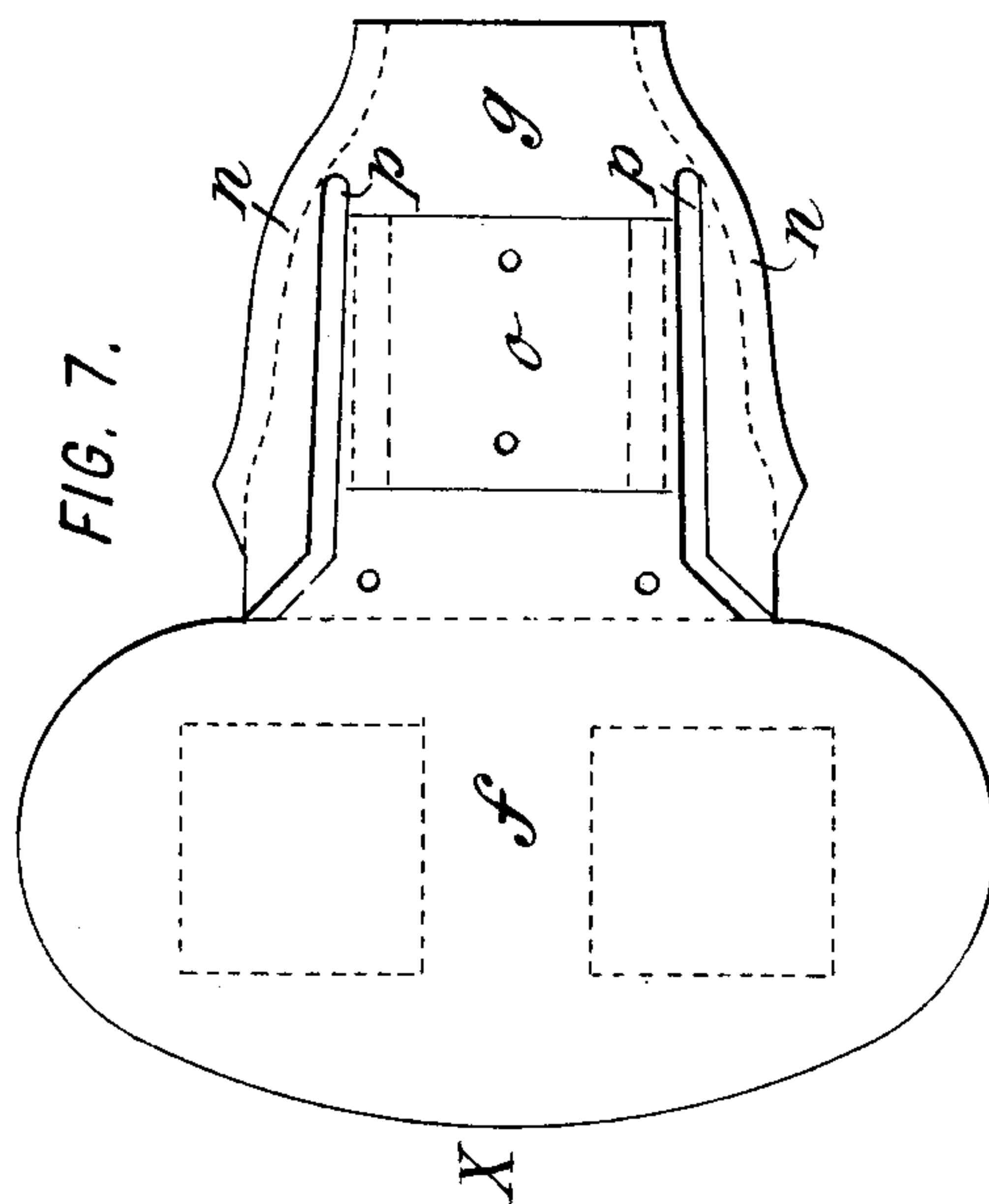
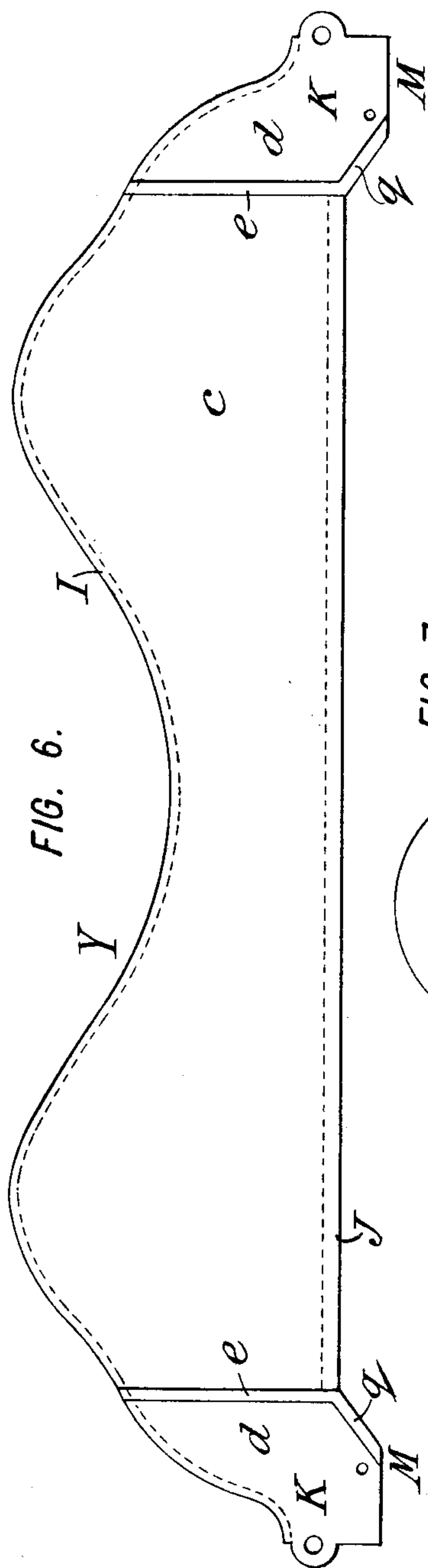
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

HENRY E. RICHMOND, OF NORTH BENNINGTON, VERMONT, ASSIGNOR TO
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STEREOSCOPE OR SIMILAR DEVICE.

SPECIFICATION forming part of Letters Patent No. 675,974, dated June 11, 1901.

Application filed December 27, 1899. Serial No. 741,727. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. RICHMOND, a citizen of the United States, residing in North Bennington, in the county of Bennington and State of Vermont, have invented certain new and useful Improvements in Stereoscopes or Similar Devices, of which the following is a specification.

This invention relates to photographic exhibition and similar apparatus, and aims to provide certain improvements especially applicable to hand stereoscopes or "scopes," as they are called in the trade.

Hand-stereoscopes as heretofore constructed generally comprise a wooden shaft, lens-frame, hood, picture-holder, and a folding handle, the hood being approximately fitted with the contour of the face to serve as a dark chamber at the rear side of the lenses, a septum being fixed between the lenses at their front side and the picture-holder being adjustable on the shaft for focusing, which latter is fixed to the lens-frame. These structures have been necessarily bulky in order to give a thickness of wood requisite to strength and proper rigidity and have been made up of many parts requiring careful joining and special attention in assembling.

My present invention aims to provide various improvements applicable to stereoscopes by which a compact, light, and convenient stereoscope may be cheaply and easily built and the number of pieces requisite to a complete scope may be reduced and also to provide a construction the size of which can be readily reduced for packing or transportation. To this end in carrying out the preferred form of my invention I provide various features of improvement in the several parts of the scope and I provide a construction which permits of the use of sheet metal for many parts of the scope which have heretofore been constructed of wood, all of which will be hereinafter more fully set forth with reference to the accompanying drawings, in which—

Figure 1 is a perspective view showing the preferred form of my improvements as applied to a hand-stereoscope for the exhibition of binocular photographic views. Fig. 2 is a

cross-section of the scope cut through the axis of the handle and looking rearwardly toward the lens-frames, as indicated by the line 2 2 of Fig. 4; and Fig. 3 is a cross-section on the line 3 3. Fig. 4 is a longitudinal section cut on the line 4 4 of Figs. 2 and 5 and looking in the direction of the arrow. Fig. 5 is a bottom plan; and Figs. 6, 7, and 8 are plan views of the blanks for the hood, lens-frame, and holder, respectively.

Referring to the drawings, let A indicate the hood, B the lens-frame, C the septum, D the shaft, E the holder, F the handle, and G the lenses, of a hand-scope.

H is a binocular photograph or other picture carried by the holder.

The hood has a rear or face edge I, which is shaped to closely fit the forehead, temples, nose, and cheeks of the user's face, so as to constitute a dark chamber, its curvature being that commonly employed for excluding light by making a close fit of the angles between the nose and cheeks. At its front edge it is carried by the lens-frame, which has a flat member closing the front end of the hood and carrying the lenses. The septum consists of a vertical partition *a* and a transverse piece *b* at the front end of this partition, the partition filling the space between the piece *b* and the lens-frame. The shaft consists of a horizontal bar carried by the lens-frame. The holder slides on the shaft toward and from the septum and has a socket, in which pictures may be successively placed. The handle is hinged beneath the shaft to fold toward the shaft when the stereoscope is not in use.

As thus far described the parts may be of any usual or suitable construction, those shown being taken merely as convenient examples for illustrating my present improvements.

I will now describe in detail the various features of improvement in construction, arrangement, and combination constituting the preferred form of my invention.

According to one feature of improvement the hood A is constructed of a single integral endless band surrounding the lenses entirely, so that no gap is left for admission of light

in the dark chamber. This band (lettered *c*) is preferably formed of a thin sheet of aluminium or other suitable non-fibrous material, which is bent up out of a blank and has the regular front edge *I* at one side, a rectangular rear edge *J* at the other side, and reduced overlapping ends *K*, which are perforated and riveted together by a rivet *L* or otherwise fastened to make an endless member, as shown. The ends *K* and the lens-frame overlap and are connected together, the ends preferably having projecting parts or wings *M*, which are suitably connected, as by rivets *N*, to the lens-frame. The top and sides of the hood are of approximately elliptical curvature, and the bottom is preferably flat and horizontal at *d*, the line between the curved and the flat portion being marked by parallel forwardly-extending stiffening-corrugations *e*.

The lens-frame *B*, I prefer to construct as a thin flat plate of non-fibrous material, preferably aluminium, *f*, with an integral lateral extension *g*, preferably extending forwardly over the shaft. This extension serves as a convenient part for overlapping the wings *M* of the hood, the rivets *N* being shown as traversing the extension *g* and the wings, respectively, and thus fastening the hood and lens-frame together. The hood and frame are strongly united at their adjacent edges, preferably by beading the one over the other. As shown, the edge *J* of the hood is beaded over the outer edge of the lens-frame at all points except opposite the extension *g*. By this construction a durable and rigid joint is obtained in a most simple manner at what has previously been the weakest point of a stereoscope. The hood being beaded over the lens-frame is prevented from longitudinal movement and being extended around it on all sides is prevented from lateral movement. The opposite edge of the hood is also shown as beaded throughout its length to afford a round smooth surface for contact with the face, thus avoiding the necessity for the use of the velvet guard heretofore employed on such edge. The forward extension *g* carries the block *a* of the septum, this being connected in any suitable manner, as by screws *h*. This block is also connected to the front side of the lens-frame, preferably by a screw *i*. The front post *b* of the septum is shown as screwed to the block *a*. The extension *g* is preferably integral with the lens-frame *B* and normally constitutes a part of what usually is termed the "shaft" of a stereoscope; but according to my invention I prefer to divide the shaft and provide a removable shaft proper, *D*, utilizing the extension *g* as a stationary shaft or frame-plate for the scope. To this end I make the shaft *D* separable from the plate *g*, so that it can be removed for packing or storage, providing separable interengaging provisions on the shaft and plate for connecting the parts together when in use. These provisions preferably consist

of a socket *j* on the plate and an end *k* on the shaft fitting this socket. The end *k* may be slightly tapered, as shown, to insure a tight fit, and the socket may be correspondingly formed to receive the end. A lock for preventing accidental separation of the shaft is provided, which is shown as consisting of an elastic projection *l* on the plate *g*, snapping into a socket *m* on the shaft, the engagement being such that a special force must be exerted to remove the shaft, thus constituting an impositive lock for said shaft.

The plate is preferably formed with tapering sides, which are shown as provided with depending flanges *n*, which serve both to give a better appearance to the side of the plate and at their forward extremities as guiding-walls for embracing the sides of the shaft. They also add considerable stiffness or rigidity to the plate. The socket *j* is preferably formed by a downwardly-pressed integral portion or strap *o* of the plate, the bottom of which passes beneath the shaft and the sides of which embrace the sides of the shaft. This strap is formed by cross-cutting the plate and pressing down the portion between the cross-cuts. To stiffen the plate, I prefer to form it with corrugations *p*, extending to near its forward edge and obliquely rearwardly to the lens-frame. These corrugations are approximately midway between the sides of the strap and the edge flanges of the plate and extend backward until they meet the wings *M* of the hood, at which point they extend obliquely outward under corrugations *q*, formed in these wings, until they meet the corrugations *e* of the hood, thus giving great lateral as well as vertical rigidity to the connection between the plate and hood and making a good appearance at the joint, the corrugations *q* appearing as a continuation of the bead surrounding the edge *J*. The stiffening of the plate *g* is of peculiar importance in the present case by reason of the necessity of preserving its flatness while the lens-frame *f* is being bent up. The corrugations stiffen the plate in the direction in which the bending strain occurs in that operation.

The handle *F* is preferably carried on the under side of the strap *o*, its usual hinge-plate *r* being furcured to the usual reciprocal plate *s*, the transverse arms *t* of which are riveted to the strap.

My invention provides for carrying the lenses by forcing in the metal of the lens-frame to make a lens-socket *P* within the dark chamber. The flange *Q* of this socket embraces the rear side of the lens and preferably has a contour corresponding to the outline of the corresponding view of the binocular photograph to be carried in the holder, the aperture through the flange being so proportioned that the edges of the flange will limit the extent of view through the lenses, so that the user cannot see the outline of the photograph being examined. The lens *G* is placed in the lens-socket *P*, a mat *R* is

placed against the side of the lens opposite the flange Q, and then the lens and mat are fixed in place by indenting the wall of the socket at one or more places, as shown at S in Fig. 4. The socket P of the lens-frame may be formed to project rearwardly into the dark chamber, so as to bring the lenses as near as possible to the eyes instead of projecting forwardly, as heretofore.

The holder E embodies several features of improvement and in its preferred form consists of a single integral piece of non-fibrous material, preferably aluminium, cut and bent into suitable form to slidably engage the shaft and removably hold the picture. As shown, a thin plate of aluminium is employed, which has a wide flat center *u* resting on top of the shaft and giving the holder sufficient resistance to prevent its tilting on the shaft, downwardly-bent sides *v* embracing the sides of the shaft, the space within these parts constituting the shaft-socket, and laterally-extending arms *w*, which are slotted at *x* and bent upwardly at *y*, forming the front and rear sides of the picture-socket, and outwardly at *z*, forming the lateral ends of these sockets. Part or all of the metal taken out of the slots *x* is folded beneath the center and forms the bottom wall T of the shaft-socket, beneath the center of which it is bent downwardly and folded over on itself and riveted together, forming a handle U for manipulating the holder. The holder may be conveniently cut out of a blank W (shown in Fig. 8) and bent on the dotted lines shown in that figure. For stiffness and adding to its ornamental appearance it is preferably formed with longitudinal corrugations V at each side of its slots *x*, these corrugations being pressed in the blank.

The lens-frame B and frame-plate *g* are preferably formed of a single integral sheet cut out in the form of a blank X (shown in Fig. 7) and subsequently flanged, corrugated, and bent by pressing or otherwise into the shape desired.

The hood may be cut in the form of the blank Y (shown in Fig. 6) and subsequently beaded and corrugated and then bent around the lens-frame and attached in position. These several blanks can be cut economically from sheet metal and easily worked into their respective forms and when assembled will make a very strong, neat, and compact stereoscope. A characteristic advantage of this construction consists in the small number of parts going to make up the scope. Where heretofore five parts have been utilized for the lens-frame alone, with my improvement one piece constitutes the lens-frame and the shaft-plate. Where the holder has generally been constructed of numerous pieces, I require but one piece. The saving in material, connections for joining, and the labor of assembling the parts resulting from these improvements is great, and the article produced is materially stronger, can be packed more

compactly, and presents an improved appearance.

In use the improved stereoscope will be used as heretofore, the user first applying the shaft, if removed, and then properly locating the holder on the shaft and adjusting it thereon to give the desired focus.

It will be seen that my invention provides improvements which can be readily and advantageously availed of, and it will be understood that I do not limit myself to the particular details of construction, arrangement, combination, or use set forth as constituting the preferred form of my invention, since it can be employed in whole or in part according to such modifications as circumstances or the judgment of those skilled in the art may dictate without departing from the spirit of the invention.

What I claim is—

1. In stereoscopes and like devices, the combination with a lens-holder made of a single piece of metal, of a hood made of a single piece of metal and having overlapping ends, said holder and hood having reciprocal inter-engaging provisions at the edge of the holder, consisting of a circumferential groove on the one and a portion on the other entering said groove in such manner that the parts cannot be separated when the overlapping ends of the hood are fastened together, and means fastening the overlapping ends of the hood together in such manner that said provisions are prevented from disengagement, and the lens-holder and hood cannot be separated.

2. The combination with a metallic lens-holder, of a hood made in one piece of metal, provided with a circumferential groove embracing and surrounding the edge of the holder and having a flange overlapping the forward side of such edge, and means passing through the hood and holder for fastening the ends of the hood to such holder in such manner that the parts cannot be separated when the ends of the hood are secured to the holder and ingress of light at the joint between the hood and holder is avoided.

3. The combination with a metallic lens-holder, of a metallic hood surrounding the edge of the holder, engaging said edge when the hood is wrapped around the holder, having projecting wings seating against the holder, and having ends which approximately meet when the hood is wrapped around the holder, and means passing through said wings and the holder, and fastening the hood to the holder in such manner that said hood is prevented from unwrapping and its ends are prevented from separating as long as the hood and holder are fastened together.

4. The combination with a lens-holder having a forward extension, of a flexible hood made in one piece of metal surrounding the lens-holder and embracing the edge thereof, having overlapping ends, and having forward extensions, and means fastening said holder and hood together through said ex-

tensions, whereby the hood and holder are fastened together and leakage of light is prevented by the overlapping ends of the hood.

5. For hoods for lens-holders, the improved blank Y having curved rearward edge I, straight forward edge J, and forwardly-projecting attaching-wings M for connecting it to the lens-holder.

6. The combination with a lens-frame for stereoscopes and the like, consisting of a metal piece having apertured lens-holding protruding portions on its rear side and lens-sockets in such portions, each socket having an opening for receiving a lens on the other side of said piece, of lenses in said sockets, and metallic means for holding said lenses in said sockets, said piece having an integral forwardly-extending shaft portion on its front side.

7. The combination with a lens-frame consisting of a metal piece having a lens-holding protruding portion on one side and a lens-socket in such portion, and having an opening for receiving a lens, of a lens in said socket, said frame having integral portions at opposite sides of said lens overhanging the latter, and preventing its escape from said socket.

8. The combination with a lens of a metallic lens-frame having a rearwardly-bent lens-holding protruding portion on one side, and having a socket receiving said lens within said portion, said frame having an integral inbent portion at each side of such lens, holding it in said socket.

9. For stereoscopes and the like, the improved lens-frame consisting of a single integral piece of metal having a vertical wall, portions projecting rearwardly from the rear side of said wall, and having in their front side lens-sockets for receiving the lenses, said sockets each having a portion for holding a lens at a point rearwardly of said wall, and means for connecting a hood at the rear side of said frame, whereby the lens can be held within the hood.

10. In a stereoscope or the like, the combination with a hood, of a lens-frame having a wall at the front end of said hood and having lens-holding portions extending from said wall rearwardly within said hood, and having inclined rear ends within the hood for holding lenses therein.

11. In stereoscopes, the combination with a metal lens-frame of a metal hood having its ends fastened together, extending around the edge of said lens-frame, having a bead along its edge, and having a cavity in its bead fitting over the edge of said lens-frame, in such manner that when said frame is embraced within said cavity and the ends of the hood are fastened together said parts are rigidly connected together.

12. In stereoscopes, the combination with a hood having a forward extension, of a lens-frame having a forward extension, and means connecting said extensions together.

13. In stereoscopes, the combination with a hood having a forward extension, of a lens-frame having a forward extension, means for connecting said extensions together, and corresponding elevations and depressions in said extensions for preventing relative lateral movement.

14. In stereoscopes, a metallic lens-frame, an integral extension of said frame projecting at right angles thereto, a shaft, and means for rigidly and detachably connecting said shaft to said extension, and a metallic hood embracing said frame and having wings connected to said extension.

15. In stereoscopes, a metallic lens-frame, an integral extension of said frame, a handle, a shaft, a strap to which said handle is attached and which with said extension forms a socket in which said shaft slides.

16. In stereoscopes, a shaft-carrier consisting of a metal plate having integral shaft-engaging provisions, in combination with a lens-frame integral with said plate, and a hood having wings riveted to and carried directly by said carrier.

17. In stereoscopes, a metallic plate having flanges at its opposite sides, a shaft fitting between said flanges, means on said plate for receiving and retaining said shaft in place, a lens-frame carried by said plate, and a hood for said frame.

18. In stereoscopes, a metal plate, a shaft, means for connecting said shaft to said plate, a lens-frame carried by said plate, and a hood for said lens-frame having wings overlapping, riveted to, and carried directly by said plate, said plate having longitudinal corrugations.

19. In stereoscopes, a hood having corrugations, oblique corrugations, and projecting wings M, in combination with a plate having corrugations coinciding with the corrugations, and means fastening the hood and plate together.

20. A blank for a stereoscope member consisting of a flexible plate adapted to form a lens-holder, an extension at one side of said plate, and a strip connected at its ends and disconnected at its sides so as to be adapted when bent downward to form with the remainder of said extension a shaft-socket.

21. A blank for a stereoscope card-holder consisting of a flexible plate having a solid central portion, portions adjacent to said central portion and adapted to be bent over to form with said central portion a shaft-socket, slotted side extensions between said central portion and the end portions, and end portions adapted to be bent to engage a card.

22. A blank for a stereoscope card-holder consisting of a flexible plate having a central portion, cut-out portions adjacent to said central portion and adapted to be bent over to form with said central portion a shaft-socket, side extensions between said central portion and the end portions, and slotted end portions.

23. In stereoscopes having shafts, a picture-holder consisting of a single integral

piece of non-fibrous material having a bent
portion constituting a shaft-socket, and up-
wardly-projected slotted ends constituting a
picture-socket, said shaft-socket extending
5 longitudinally of said shaft sufficiently to pre-
vent its tilting on said shaft and being adapt-
ed to slide thereon.

24. In stereoscopes, a picture-holder E hav-
ing downwardly-extending portions *v*, slots *x*,

and reversely-bent portions T having united 10
ends U.

In witness whereof I have hereunto signed
my name in the presence of two subscribing
witnesses.

HENRY E. RICHMOND.

Witnesses:

GEORGE H. FRASER,

THEO. T. SNELL.