

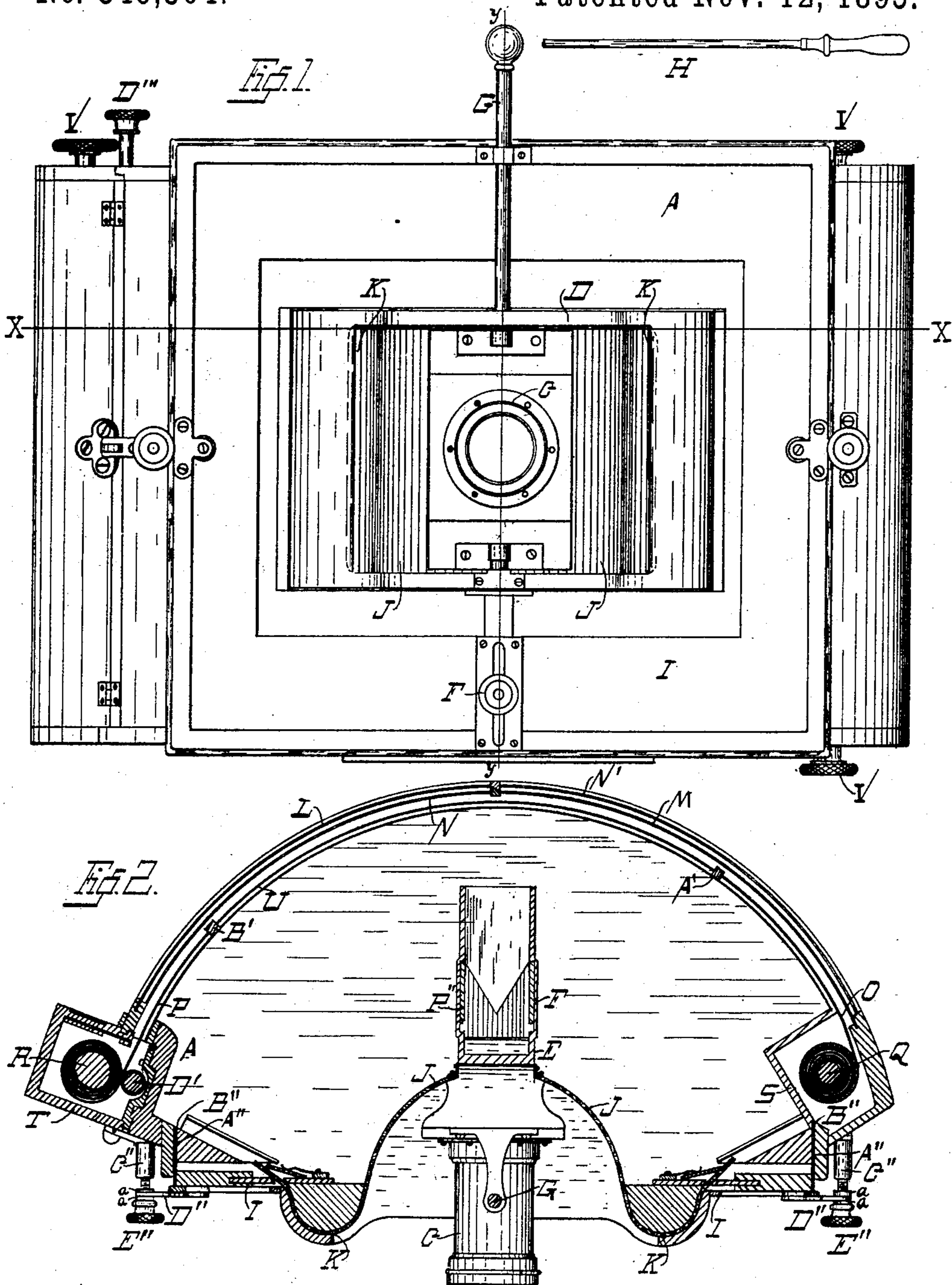
(No Model.)

3 Sheets—Sheet 1.

F. F. DUMKE.
PANORAMIC CAMERA.

No. 549,504.

Patented Nov. 12, 1895.



Witnesses:
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(No Model.)

3 Sheets—Sheet 2.

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Fig. 4.

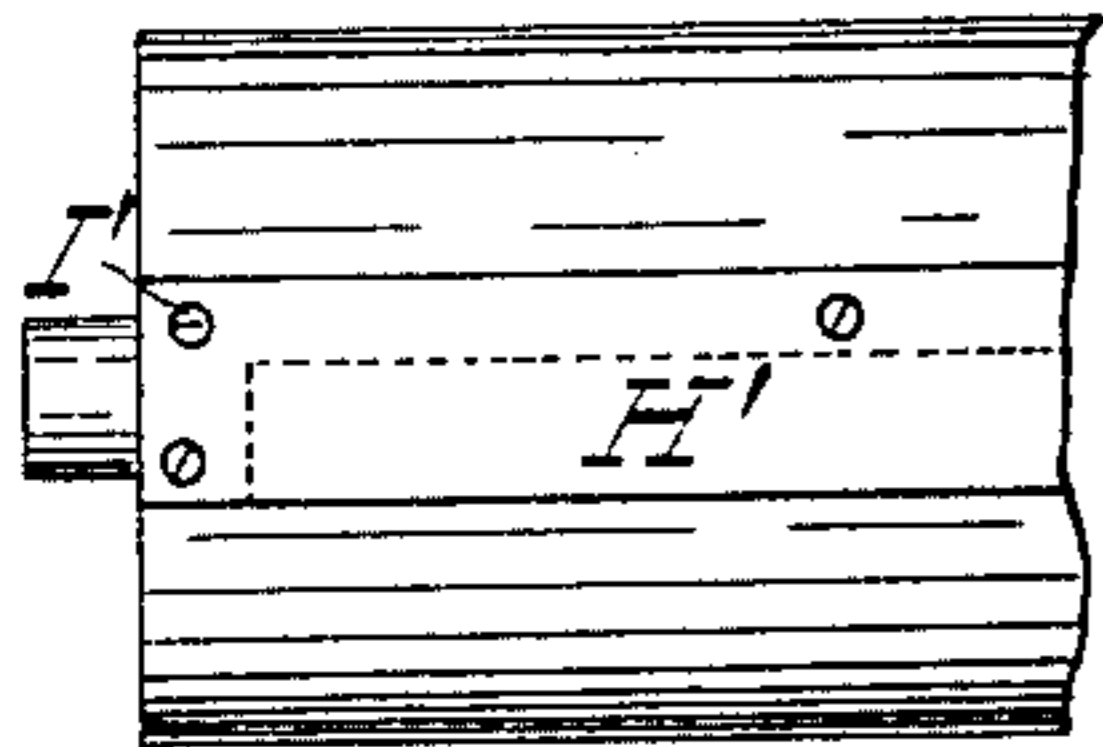


Fig. 5.

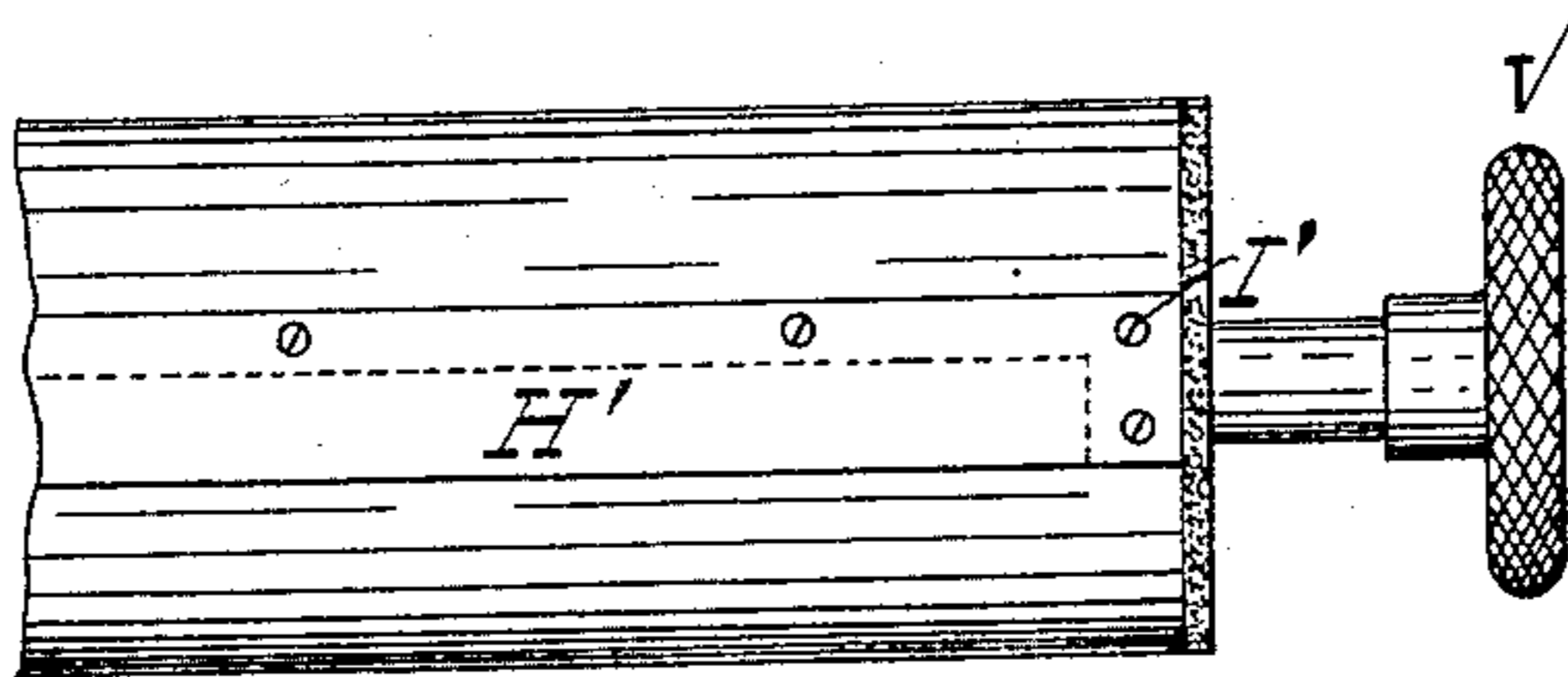
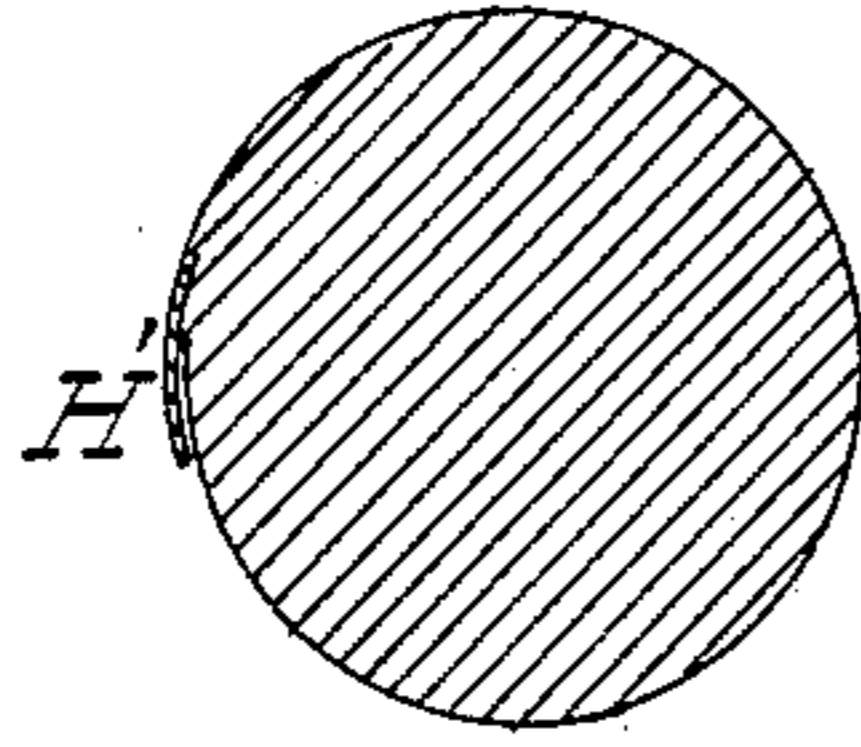
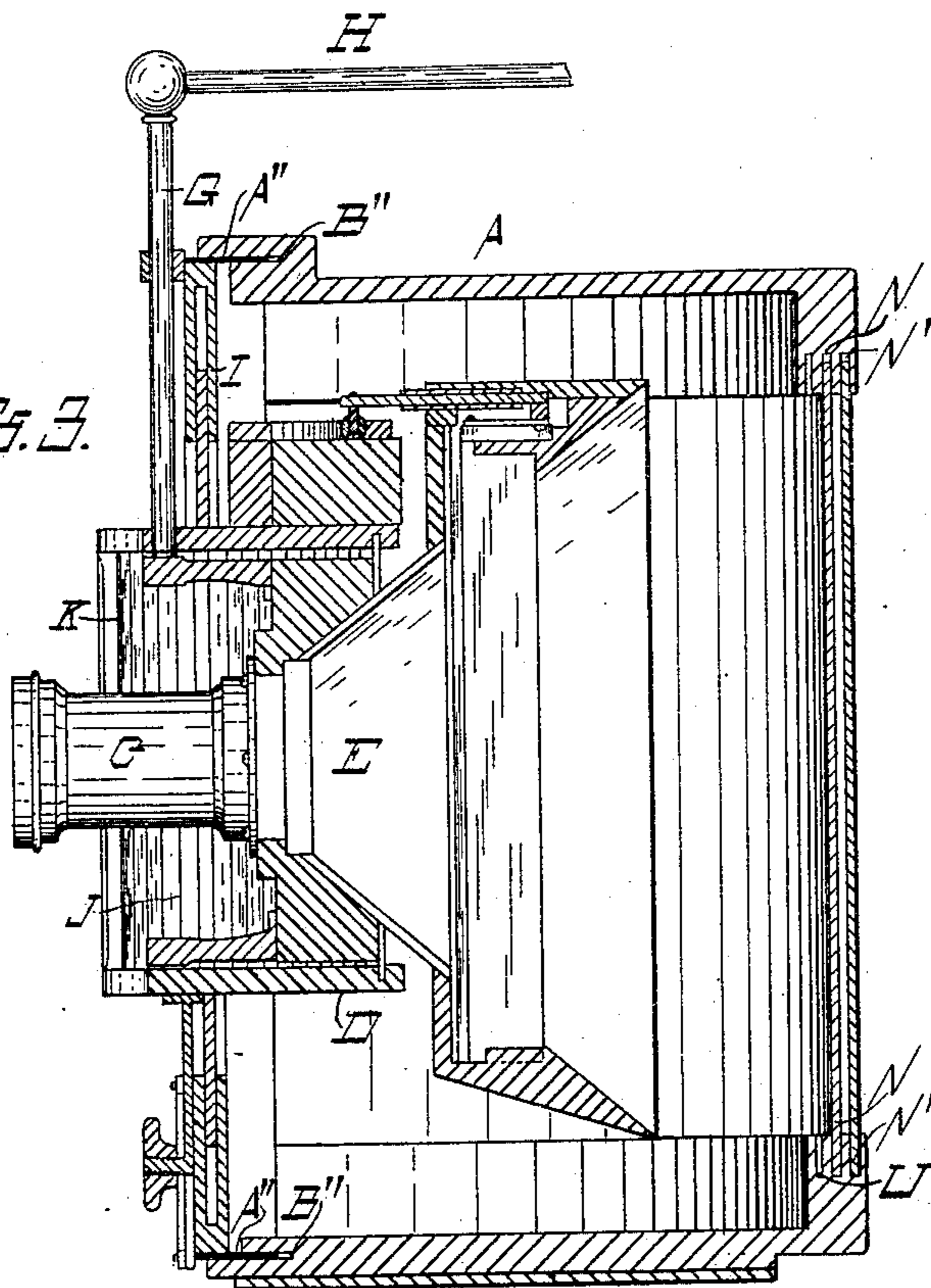


Fig. 3.



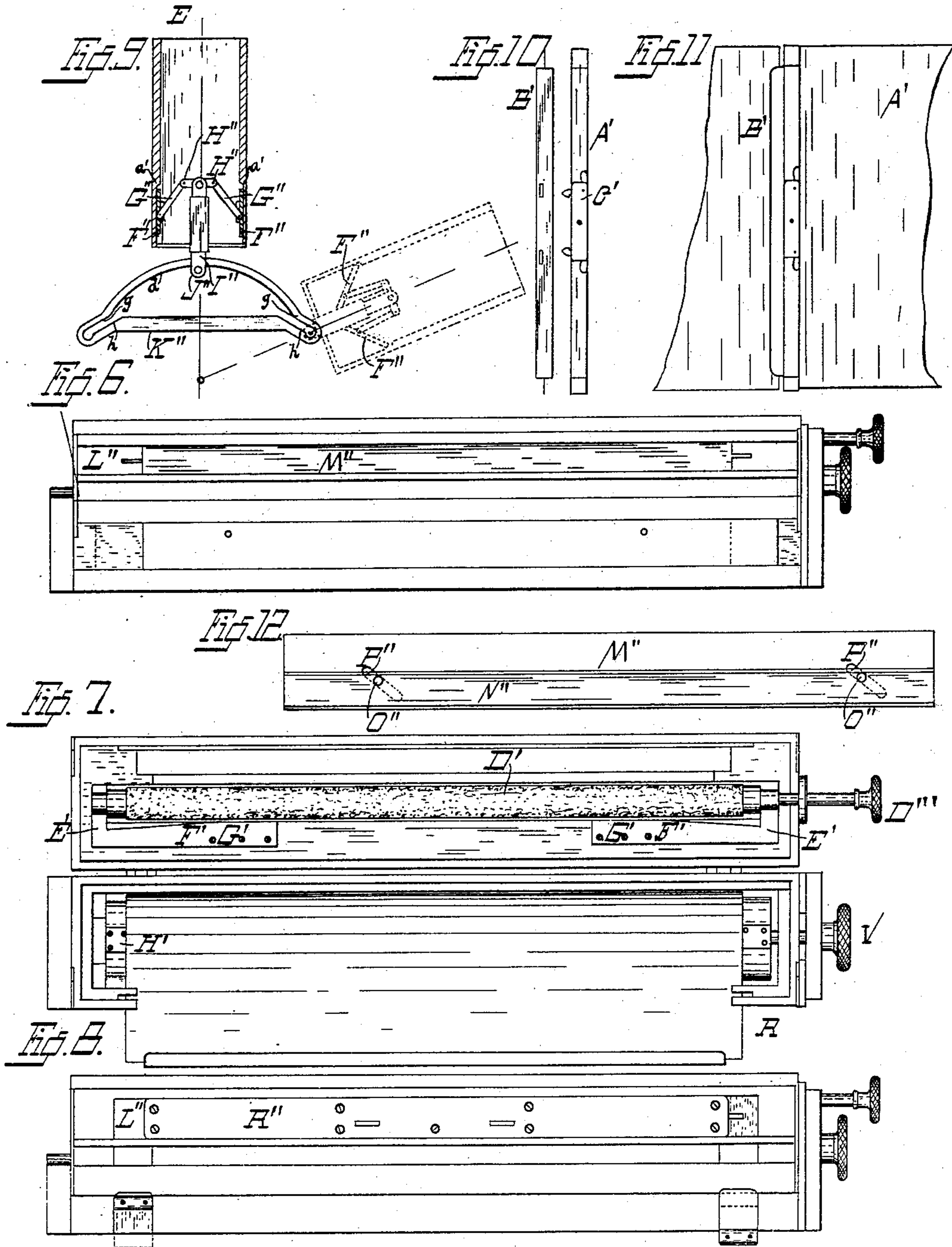
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UNITED STATES PATENT OFFICE.

FRANK F. DUMKE, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO WILLIAM H. KIRK, OF SAME PLACE.

PANORAMIC CAMERA.

SPECIFICATION forming part of Letters Patent No. 549,504, dated November 12, 1895.

Application filed May 7, 1895. Serial No. 548,369. (No model.)

To all whom it may concern:

Be it known that I, FRANK F. DUMKE, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Panoramic Cameras, of which the following is a specification.

My invention relates to improvements in panoramic cameras; and it consists in the matters hereinafter described, and set forth in the claims.

In the drawings, Figure 1 represents a front view. Fig. 2 is a horizontal section drawn on line *xx* of Fig. 1. Fig. 3 is a vertical section drawn on line *YY* of Fig. 1. Fig. 4 is a side view, and Fig. 5 a cross-section of one of the rollers, upon which a sheet of celluloid or so-called "film" is supported, removed from its inclosing case, a similar roller being used at each of the front corners of the camera. Fig. 6 represents one of the roller-supporting cases removed from the camera. Fig. 7 represents one of the roller-supporting cases removed from the camera and thrown open upon its hinges, disclosing to view one end of the film, the film-supporting roller, and the friction-bearing roller therein. Fig. 8 represents a modified form of the roller-supporting case shown in Fig. 1. Fig. 9 is a top view of the mechanism for automatically operating the folding doors or shutters of the hood by which the light is obstructed. Fig. 10 represents the supporting-bars for the ends of the respective films. Fig. 11 represents the protruding ends of the films with the end supporting-bars locked together. Fig. 12 represents a door for closing the aperture of the roller-supporting case through which the film is drawn from its roller.

Like parts are referred to by the same reference-letters throughout the several views.

In the drawings the stationary frame A, the lens-tube C, with its lenses (not shown) and its supporting-frame D, the hood E, the lens-adjusting mechanism F, the vertical rod G, by which the lens and its supporting-frame are turned upon their pivotal bearing, and the operating-handle H are all constructed and arranged in their relative position to each other and adapted to be operated in the ordinary manner.

The spaces between the hood E and the front wall I of the camera are closed with flexible curtains J J, which are preferably formed of a series of narrow strips of wood secured together by cloth or other flexible material to which they are glued or otherwise affixed. The inner ends of the curtains J J are permanently attached to the hood E, while their outer ends extend into the curved guideways K K, through and by which they are guided in a circular course back through the front walls of the case toward the right and left into the interior of the camera. One of the curtains J is forced by the movement of the hood inward through one of the guideways K as the other is drawn outward through the other guideway K, by which arrangement a separate receptacle located in front of the camera as heretofore made becomes unnecessary.

Heretofore it has been common to construct the curved rear wall of the camera in one continuous slide, which, when desired to reach the films within, is necessarily removed from the camera. By my improvements such rear wall is formed in two separate parts or slides L and M, each of which is provided with separate grooves N N', whereby when desired to reach the films one of said slides is moved past the other, thus exposing one-half of the films at a time.

Referring to Fig. 2, when desired to open the space upon the right the slide M is moved beneath the slide L upon the left-hand side, and when desired to open the space upon the left-hand side, the slide L is moved toward the right in its groove N, outside of the slide M, whereby it becomes unnecessary to remove either of said slides from the camera.

Heretofore it has been common to store the films in a separate receptacle from the camera. By my present improvement the non-sensitive film O and the sensitive film P are provided with special receptacles therefor in the camera. The non-sensitive film O is supported on the roller Q, while the sensitive film P, upon which the picture is taken, is supported upon the roller R. These rollers Q and R are each provided with roller-supporting cases S and T, so located that either of the films may be unrolled therefrom and

drawn out through the semicircular guide-way or groove U in rear of the hood, as desired. Preparatory to focusing the lens for the picture the non-sensitive film O is first
 5 drawn out through said groove U, while the sensitive film P is left upon its roller. When ready to take the picture, the non-sensitive film O is again withdrawn from the groove and wound upon its roller, while the sensitive
 10 film P is simultaneously unwound from its roller and drawn out through the same supporting-groove from which the other film is withdrawn. The rollers Q and R are simultaneously operated by turning the knobs V V,
 15 which are connected therewith through the walls of the case, whereby as either of said films is withdrawn and wound about its roller the other is unwound and drawn out. The protruding ends of the respective films O and
 20 P are provided with vertical supporting-bars A' and B', which bars are provided with interlocking mechanism C', of ordinary construction, by which the ends of said films may, if desired, be locked together, thus enabling
 25 the operator to move the respective films simultaneously.

To facilitate in unwinding the film P from the roller R, an auxiliary friction bearing-roller D' is provided, which roller D' is sup-
 30 ported at its respective ends in movable spring actuated journal-bearings E' E', and by which said roller D' is kept in contact with the coils of said film P, by which as the film is being wound upon its supporting-roller R said
 35 friction-roller D' is permitted to move backward with each additional coil of the film, while it maintains a uniform pressure against it. The primary object of said auxiliary roller D' is to aid in unwinding the film P from the
 40 roller R, which end is accomplished by turning said roller D' by the hand of the operator, the roller R being turned by the action of the unwinding film. The roller D' is provided at its protruding end with a knob D'', by
 45 which it is turned, when by the friction of contact of the roller D' against said film P the same is drawn from the roller R and forced outward through its guideway or groove U. To increase the friction of the roller D', it is
 50 preferably covered with plush, chamois-skin, or other similar substance. When desirous to rewind said film upon the roller R, said roller R is turned by the hand of the operator, while the roller D' is moved only by the action
 55 of the film against it. The journal-bearings E' E' are each formed in a single piece with the spring-plates F' F', which plates are secured to the side of the inclosing-case by screws G' G'. The rollers Q and R are each
 60 provided with a film-retaining clasp H', which is secured thereto by screws I', the office of which clasps is to engage the inner ends of the films, which are inserted beneath them, as indicated by dotted lines in Fig. 4. These
 65 clasps impinge upon the ends of the films and cause them to be wound upon the rollers as the same are turned.

A further novel feature of my device consists in the mechanism for automatically folding the doors or shutters F''.

The operating mechanism consists of the
 70 links G'' G'', lugs H'' H'', sliding bar I'', provided with the friction-roller J'', and the cam K''. The links G'' are pivoted at one end to the respective doors and at their other ends
 75 to the lugs H''. The central portion d of the cam K'' is semicircular in shape, while it diverges outwardly at its respective ends, forming angular bends g. The roller J'' is adapted to bear against the inner edge of the
 80 cam K''. As the hood E is swung on its supporting-pivots, the roller J'' moves in the same circle described by the bearing-surface of the cam K'', whereby the roller J'' moves across
 85 the center portion of said cam without actuating said roller J''. As soon, however, as the hood is moved toward the right or left far enough to bring the roller J'' in contact with the bearing-surface h, said slide I'' is pushed
 90 rearward, whereby motion is communicated through the links G'' to the shutters F'', and the front edges of said shutters are drawn together and said shutters are closed, thereby causing the light through said hood to be ob-
 95 structed at each end of the movement of said hood. When, however, said hood is moved inward toward the center, said roller J'' is brought in contact with the bearing-surfaces of the angular bends g of said cam, whereby
 100 said slide I'' is drawn forward, when motion is communicated thereby through said links G'' G'' to the respective shutters, and the same are simultaneously thrown open.

Heretofore in focusing the object upon the film it has been common to produce the re-
 105 quired adjustment between the lens and the film through the medium of flexible walls or so-called "bellows." By my present improvement this adjustment is accomplished by making the front wall I, with its support-
 110 ing-lens, adjustable in its relation to the body of the camera. The front wall I is provided with the rearward-projecting flange A'', which extends around the entire marginal edge of
 115 said adjustable front, and a corresponding recess B'' is formed therefor in the stationary frame.

The stationary frame is provided at its re-
 120 spective sides with screw-threaded supporting bearings C'' for the reception of the adjusting-screws E'' E'', and the front wall I is connected with said screws E'' by the arms D''
 125 D'', which arms are rigidly affixed at one end to said adjustable front, and their other ends have bearings between the collars a a, formed on said screws E'', whereby as said screws E'' are turned inward or outward they carry with them said adjustable front, whereby the de-
 130 sired focus is produced.

T is a detachable roller-case by which light
 130 is excluded from the sensitive film, which is stored and retained therein in readiness for use preparatory to taking a picture. This case consists simply of two end pieces and

three vertical roller-inclosing walls secured at right angles to each other and the end pieces upon three sides of the film-supporting roller, while one side of the case is closed (when in position for use) by the contiguous walls of the camera-case, to which it is temporarily attached by retaining hooks or buttons. When one film is used, the case can be removed and replaced with another case, in which a similar sensitive film has previously been stored. To exclude the light from the sensitive film when wound upon its roller within said inclosing-case, the aperture L'' , through which said film is withdrawn, is closed by the slide M'' . The slide M'' is supported in guide-bearings at its respective ends and is moved laterally across said aperture L'' by moving the slide N'' vertically. The lateral moving slide M'' extends beneath the slide N'' and is provided at its respective ends with stationary pins O'' , which have bearings in the angular slots P'' , whereby as said slide N'' is moved downward said slide M'' is drawn toward it, and said aperture L'' is thereby opened. When, however, said slide N'' is moved upward, said slide M'' is, by the reversed action of said pins in said angular slots, moved in the opposite direction, and said aperture L'' is thereby closed.

In the modified form shown in Fig. 8 the aperture L'' is closed by the film-supporting plate R'' , which as said film is drawn into its receptacle is brought in front of said aperture L'' , and the same is thereby closed.

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

1. In a panoramic camera, the combination with the swinging hood located within the inclosing walls of the case, and the two flexible curtains closing the spaces between the respective sides of the lens tube and the stationary front walls of the case of the two semi-circular return guide-ways for said curtains communicating from the exterior to the interior of the camera case, whereby as the respective sides of the curtains are moved outward and forward across said space, their free ends are led rearward to the interior of said case and separate exterior receptacles therefor are avoided, substantially as and for the purpose specified.

2. In a panoramic camera, the combination with the film supporting roller R , of the movable friction bearing roller D' , spring actuated journal bearings E' , and journal supporting springs F' , F' , said roller D' being adapted as it is turned against said film, to unwind the same from its supporting roller, substantially as and for the purpose specified.

3. In a panoramic camera, the combination with the camera case of a permanent roller inclosing case S and the detachable roller in-

closing case T , said detachable case T being temporarily locked to said camera case and adapted to be withdrawn and exchanged for another, substantially as and for the purpose set forth.

4. In a panoramic camera, the combination of the stationary front, rectangular walls of the camera case, movable adjustable front wall I , rearward projecting flange A'' , having a corresponding recess B'' formed therefor in said stationary frame, into which it is fitted, stationary screw-threaded supporting bearings C'' affixed to said stationary frame, arms D'' D'' affixed to said adjustable front and adjusting screws E'' , E'' , provided with collars a , a adapted to bear against the respective sides of said arms D'' , whereby said adjustable front is adapted to be moved inward and outward, and adjusted by turning said adjusting screws in their bearings, substantially as and for the purpose specified.

5. In a panoramic camera, the shutter actuating mechanism consisting in the combination with the doors or shutters F'' , F'' hinged at their rear edges to the vertical walls of the hood of the connecting links G'' , G'' , pivotal lugs H'' , H'' , reciprocating slide I'' provided with the friction roller J'' and the stationary cam K'' having a central semi-circular bearing surface d corresponding in shape to the circle described by said friction roller, and angular outwardly diverging bearing surfaces g , g and h , h , said cam being adapted by contact with said roller, to actuate said slide I'' at each end of its movement as said hood is swung, whereby said shutters are automatically opened and closed at the desired point in such swinging movement of the hood, substantially as and for the purpose specified.

6. In a panoramic camera, the combination with the protruding ends of the roller supported non-sensitive and sensitive films, of the vertical film supporting guide bars A' and B' , and inter-locking mechanism C' , substantially as and for the purpose specified.

7. In a panoramic camera, the combination with the roller case T and the film supporting rollers of the laterally moving slide M'' , provided with actuating pins O'' , O'' , and vertical moving slide N'' provided with the angular bearing slots P'' for the reception of said pins O'' , whereby as said slide N'' is moved vertically, a lateral movement is communicated to said slide M'' , and the aperture through which the film is moved to and from said case, is opened and closed, all substantially as and for the purpose specified.

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

FRANK F. DUMKE.

Witnesses:

JAS. B. ERWIN,
CLARA L. ROESCH.