(No Model.)

R. BUCHANAN.

Apparatus for Opening and Closing Camera Shutters.

No. 237,165. **Patented Feb. 1, 1881.**

FIG 1

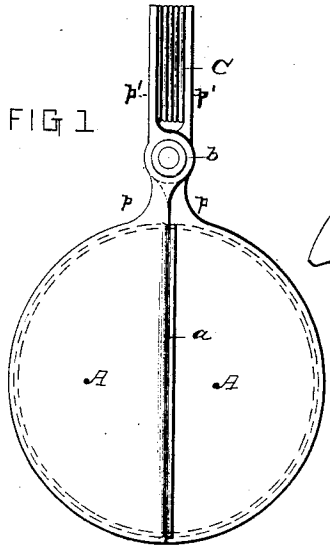


FIG 2

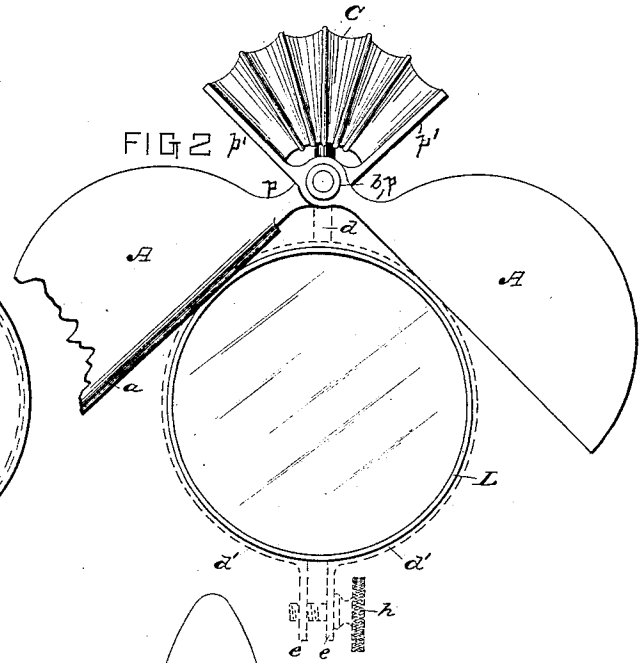


FIG 3

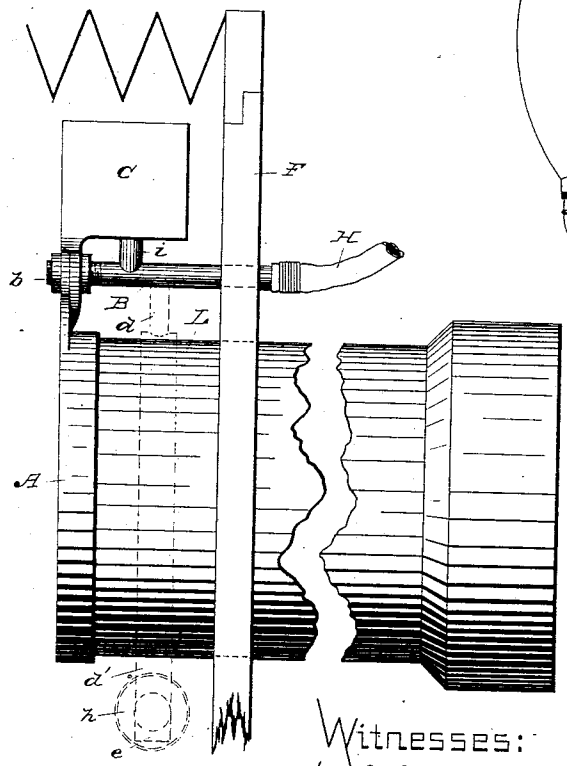
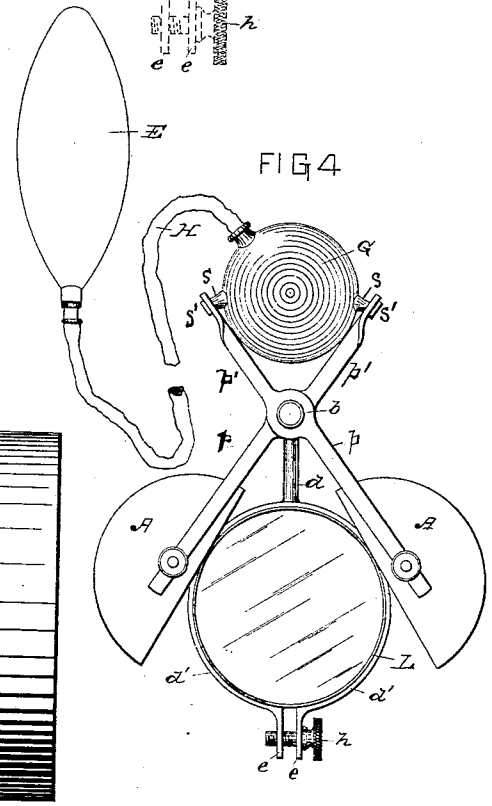


FIG 4



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UNITED STATES PATENT OFFICE.

RALPH BUCHANAN, OF URBANA, OHIO.

APPARATUS FOR OPENING AND CLOSING CAMERA-SHUTTERS.

SPECIFICATION forming part of Letters Patent No. 237,165, dated February 1, 1881.

Application filed October 29, 1880. (No model.)

To all whom it may concern:

Be it known that I, RALPH BUCHANAN, a citizen of the United States, residing at Urbana, in the county of Champaign and State of Ohio, have invented certain new and useful Improvements in Apparatus for Opening and Closing Camera-Shutters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to apparatus for opening and closing camera-shutters; and it consists in details of construction and arrangement of the several parts, as will be more fully set forth in the specification, and pointed out in the claims and accompanying drawings, in which—

Figure 1 is an end view of the shutter closed; Fig. 2, an end view showing the shutter opened; Fig. 3, a side elevation of the camera-tube with the improved shutter attachment; Fig. 4, an end elevation showing the shutter open and the actuating mechanism.

Heretofore the capping and uncapping or opening and closing of the camera-tube has been done directly by the hand of the operator, or by means of a disk actuated by a rod and spring attached to the bellows in such manner that the disk is raised and lowered as the bellows is alternately filled with air from an air-chamber. In the first instance the movement of the cap is necessarily slow and uncertain, and if the cap binds on the lens-tube the focus is apt to become deranged and the picture contracted or distorted. In the latter case, when the disk is raised and lowered, there is liability of shadows and uneven distribution of light in the lenses. Moreover, the springs deteriorate with use, and the disk does not always respond quickly to the movement of the air-column.

Referring more particularly to the drawings, A represents the shutter, made in two parts, as shown in Figs. 1, 2, and 3, each side of the shutter being joined to a lever-arm, $p\ p'$, suitably pivoted together at b. The ends $p'\ p'$ of the lever-arms, on the sides of the pivot opposite the shutter, are secured to the bellows C, or, preferably, to a thin rubber bulb, G, attached to the ends p' of the lever-arms by ears or projections s, which are secured by any suitable fastening device, s'. Communicating with the bulb or bellows is a flexible tube, H, which opens into an elastic air-chamber, E, of proper size to be conveniently handled by the operator. The several parts of the mechanism are supported by a frame or standard, d, secured to an open metallic ring or band, d', having the projections $e\ e$, through which pass a set-screw, h. This enables the device to be removed from one camera-tube and placed on another of different size, the open band or ring d' being made adjustable by means of the projections $e\ e$ and set-screw h.

The interior edges of the shutter may be beveled, as shown at a, Figs. 1 and 2, so that when closed one side may pass under the beveled edge of the other, and thus more effectually exclude light.

In Fig. 3, F represents the frame of the camera-box, through which passes a pipe, B, with an inlet-pipe, i, opening into the bellows or bulb, the flexible tubing G being connected to the pipe B on the outside of the camera-box.

In operation, after the camera has been properly focused, the operator compresses the air-bulb E and inflates the bellows or bulb G, which, through the intervention of the pivoted arms $p\ p'$, forces back or opens the sides of the shutter, as indicated in Figs. 2 and 4. When the time arrives for closing the shutter and excluding the light it is only necessary to release the grasp on the air-chamber E, so that the air is allowed to flow back from the bellows or bulb, and the shutter instantly resumes its closed position. There may be attached to the levers a suitable locking device; but it is not at all essential, as the operator can manipulate the camera and keep the shutter open by simply keeping a pressure on the air-chamber. The several parts of the device are light and durable. The shutter and lever-arms can be made of wood, metal, or hard rubber, are easily renewed or repaired, and can be applied to any form of camera.

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

1. The combination, with a camera-shutter made in two parts and secured to pivoted levers supported by a standard on an adjustable band surrounding the camera-tube, of a flexible air-bulb or bellows actuating the levers and shutter, substantially as described, and for the purpose set forth.

2. The combination, with a camera-shutter consisting of two parts attached to the bellows or air-bulb by pivoted lever-arms, of a supporting-standard, an adjustable tube, and encircling band, substantially as described, and for the purpose set forth.

3. In a device for operating a camera-shutter, the combination, with an air-bulb or bellows provided with projecting ears, of two pivoted levers, said levers being directly actuated by the air-bulb, substantially as described.

4. The combination of the tube L, adjustable band d', support d, pivoted levers $p\,p'$, the air-bulb or bellows, flexible tube H, and air-chamber E, substantially as described, and for the purpose set forth.

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

RALPH BUCHANAN.

Witnesses:

JAMES L. DALLAS,

A. H. MCFARLAND.