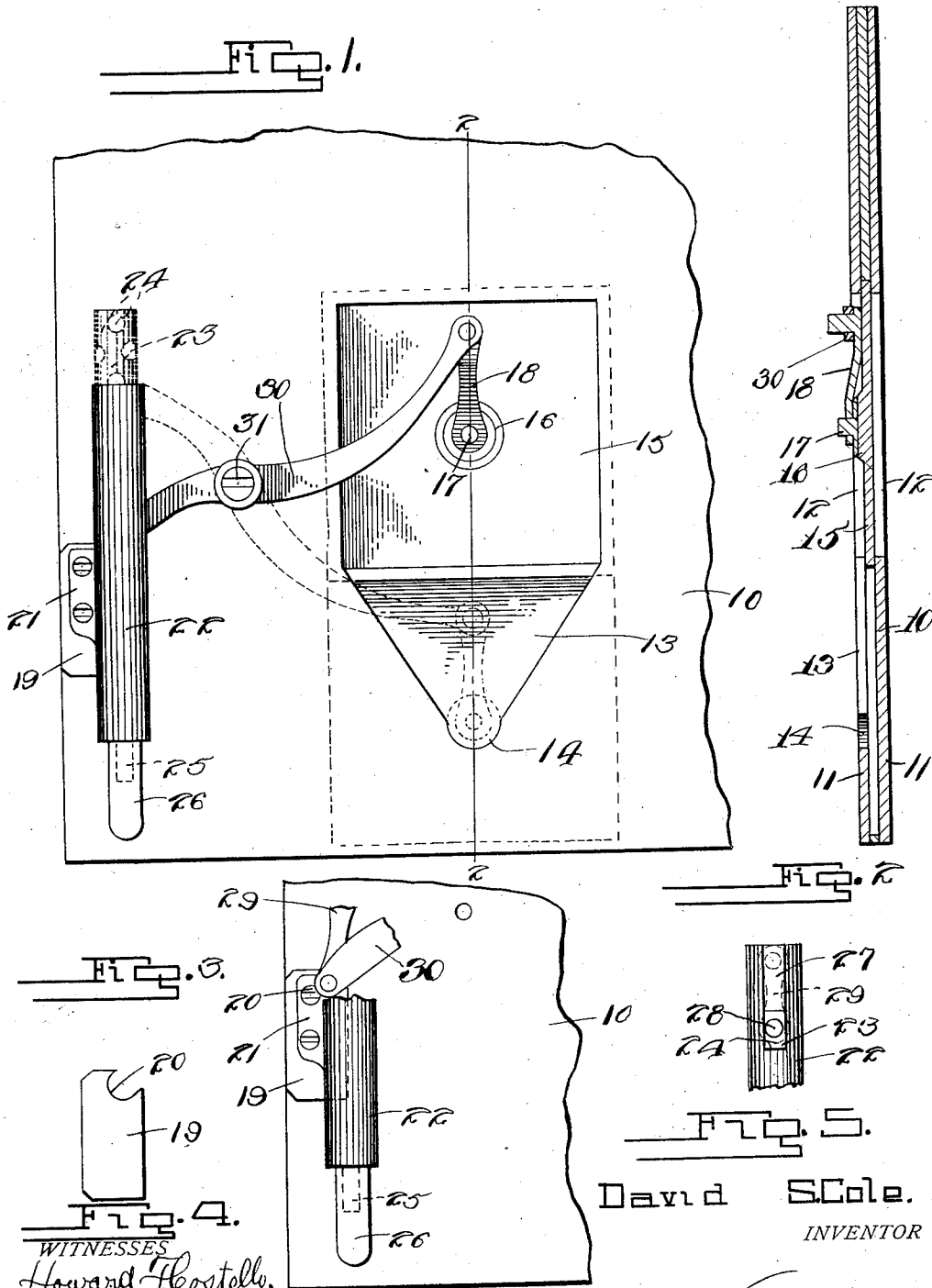


D. S. COLE.
 PHOTO SHUTTER.
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1,047,915.

Patented Dec. 24, 1912.



WITNESSES
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UNITED STATES PATENT OFFICE.

DAVID S. COLE, OF WASHINGTON, IOWA.

PHOTO-SHUTTER.

1,047,915.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, DAVID S. COLE, a citizen of the United States, residing at Washington, in the county of Washington and State of Iowa, have invented certain new and useful Improvements in Photo-Shutters, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention relates to photograph shutters and the principal object of the invention is to provide an improved shutter of the pneumatically operated type which will be very light of movement.

15 A second object of the invention is to provide a shutter of the class described wherein friction will be greatly eliminated.

A third object of the invention is to provide a shutter of this class with means for stopping the same at each end of its stroke.

20 With the above and other objects in view the invention consists in general of certain novel details of construction and combinations of parts as will be hereinafter fully described, illustrated in the accompanying drawing, and specifically claimed.

25 In the accompanying drawings, like characters of reference indicate like parts in the several views, and: Figure 1 is an inside view of a camera equipped with this shutter. Fig. 2 is a section on the line 2—2, Fig. 1, certain of the parts being omitted as tending to confuse the device desired to be shown. Fig. 3 is a detail view of a certain stop and the adjacent parts used in connection therewith. Fig. 4 is a detail view of the stop removed from the front board of the camera. Fig. 5 is a view showing the underside of the air tube used herewith.

30 The numeral 10 indicates the front board of the camera and this front board is composed of a pair of spaced members 11 so arranged that openings 12 made in each of these members are opposite to each other. From the opening 12 to the inner member 11 there is a triangular extension 13 which runs downwardly and terminates in an arcuate lower corner 14. Slidably mounted between the members 11 is a shutter 15 having centrally disposed on its rear face a boss 16 whereto is connected by means of a pin 17 a link 18 having an arcuate lower end so that when the shutter is moved downward the lower end of the link 18 will contact with the arcuate lower corner 14 and

act as a stop to limit further movement of the shutter in this direction.

60 Adjacent one side of the front board 10 there is provided a plate 19 having one of its upper corners reentrant as at 20, the reentrant portion being concave in elevation, as shown in Fig. 4. Secured upon this member 19 is a bracket 21 which carries a tube 22 wherein moves a plunger 23 comprising a tube with a closed lower end the side walls of the tube being perforated as at 24 for the purpose of lightening the same. The lower end of the tube 22 is reduced as at 25 to receive the upper end of a flexible tube 26 preferably of rubber and this flexible tube may be carried to any point advisable and supplied with any means of forcing air therethrough and withdrawing the same. The side of the tube 22 which faces the board is provided with a slot 27 wherein moves a pin 28 fixed upon the plunger 23. Depending from this pin 28 is a link 29 which has pivoted to its lower end one extremity of an S-shaped lever 30 (in Fig. 3) the other extremity of said lever being pivoted to the lever 18, the lever being pivotally fulcrumed by a screw 31 intermediate its ends. This lever is curved in this manner so that when the parts are in the dotted line position shown in Fig. 1 the lever will not lie over the openings 12 but will leave these openings clean for sight. Furthermore, between the two extreme positions the upper left hand corner portion of the shutter 15 will never pass beneath the lever so that at no time can the lever 30 intersect the openings 12. It will be noted that, when the lever is in its lowermost position the lower end of the link 29 engages in the notch 20.

95 In the operation of the device the shutter is used in the usual manner, air being alternately forced into and out from the tube. As the air is forced in the plunger 23 will rise and the shutter 15 is drawn down—this operation being performed with great ease and quietness because of the peculiar manner in which the lever 30 is connected by the links 18 and 24 respectively to the shutter and plunger so that there is no sliding friction such as is caused by a pin and slot connection between the lever 30 and any of the rest of the mechanism. By reason of this a very simple and uninterrupted movement is had of the shutter 15 so that the pictures

may be taken without jar or shock. Furthermore, the stops 14 and 20 being arcuate lend themselves to stopping the shutter both in its upward and downward movements
5 without shock while, at the same time, leaving the return of the parts from the stop perfectly free.

There has thus been provided a simple and efficient device of the kind described and for
10 the purpose specified.

Having thus described the invention, what is claimed as new, is:—

In combination with a front board comprising a pair of spaced members having
15 opposed apertures, one of said apertures further having a downward triangular extension terminating in an arcuate corner, of a shutter slidable between said members to cover said apertures, an air tube mounted

upon said front board and having its upper end slightly spaced therefrom, a stop beneath said air tube having an arcuate seat, a plunger slidable in said air tube, a link having its upper end pivoted to said plunger and its lower end adapted to engage
25 the seat of said stop, a second link having its lower end pivoted to said shutter and adapted to engage the arcuate lower corner when depressed, and an S-shaped lever having its ends pivoted respectively to said
30 links and its center to said board.

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

DAVID S. COLE.

Witnesses:

S. W. NEAL,

W. J. HAMILTON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."