

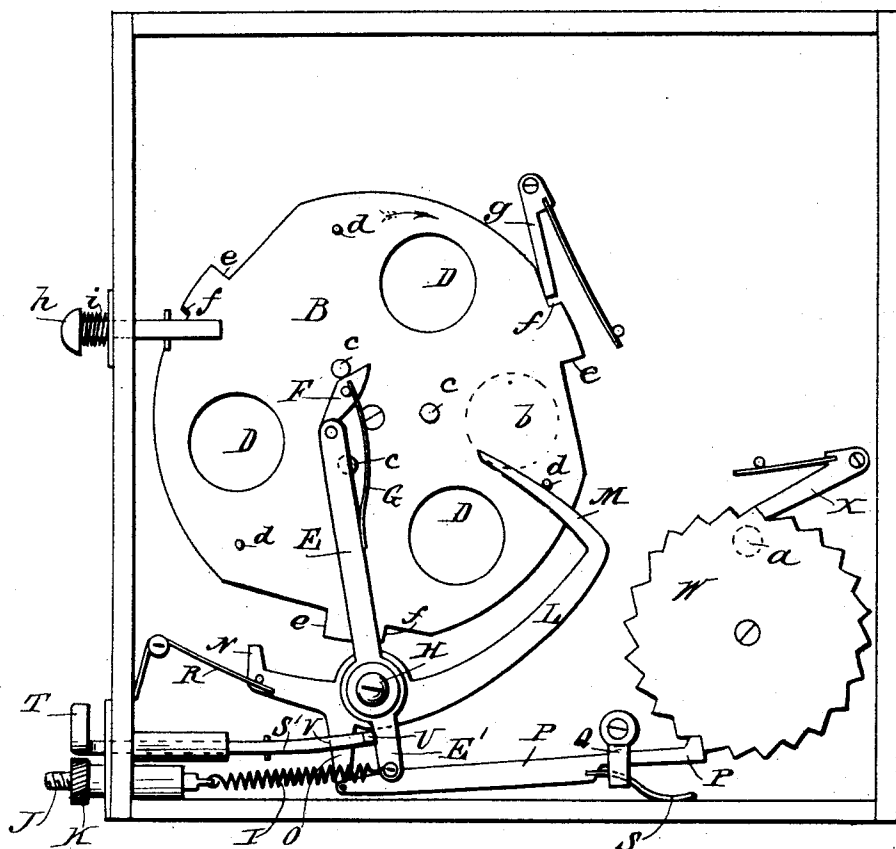
F. A. ANTHONY & W. H. LEWIS.

PHOTOGRAPHIC SHUTTER.

No. 471,088.

Patented Mar. 22, 1892.

Fig. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE

FREDERICK A. ANTHONY, OF HACKENSACK, NEW JERSEY, AND WILLIAM H. LEWIS, OF HUNTINGTON, NEW YORK, ASSIGNORS TO THE E. & H. T. ANTHONY & COMPANY, OF NEW YORK, N. Y.

PHOTOGRAPHIC SHUTTER.

SPECIFICATION forming part of Letters Patent No. 471,088, dated March 22, 1892.

Application filed October 28, 1890. Serial No. 369,544. (No model.)

To all whom it may concern:

Be it known that we, FREDERICK A. ANTHONY, residing at Hackensack, in the county of Bergen and State of New Jersey, and WILLIAM H. LEWIS, residing at Huntington, Long Island, New York, both citizens of the United States, have invented certain new and useful Improvements in Photographic Shutters, of which the following is a specification.

Our invention relates to improvements in photographic shutters; and it consists in the construction and arrangement of the parts whereby the various exposures are made by continuous rotation of a shutter provided with a series of apertures.

It also consists in an index which registers the number of exposures made, which is automatically operated by the same act that operates the shutter.

We also have an attachment to the shutter whereby we may make time exposures.

In the drawings, Figure 1 illustrates an elevation showing the interior mechanism of the shutter, the front of the shutter-case having been removed and the parts being in their position to make an instantaneous exposure. Fig. 2 illustrates the parts shown in Fig. 1 in the position which they assume during the resetting of the shutter. Fig. 3 illustrates a view of the reverse or front side of the shutter-case, showing the exposure-aperture and the index-aperture. Fig. 4 is a perspective of an alternative form of shutter-throwing lever.

A is the case of the shutter. It may be made of such shape and material as desired. It is preferably provided with a cover, which is not shown in the drawings.

B is the shutter. It is pivoted at C to the case and is provided with openings D D D. There may be more or less of these openings than shown, and the shutter may be substantially circular or of such other form as desired.

E is the shutter-throwing lever. It is provided with a pivoted pawl F at one end, which is controlled by a spring G, attached to the lever E, as shown. The lever is pivoted at H to the case, and at the other or short end of

the lever is attached a spring I, which at one end is attached to an adjustable spindle J, fastened to the case, which may be moved in or out and set at such position as desired by the adjusting-nut K, the spindle being threaded, as shown, for that purpose. Thus the tension on the spring I may be regulated as desired.

L is a curved lever, also pivoted on the pivot H. It has at one end an arm or finger M and at its other end two projecting arms, one of them N, which acts as a hold for the shutter, and the other one O, to which is pivoted the index-operating bar P, which is held in position under the clip Q by a spring S, so that it may have a slight tilting movement during the operation of the device.

R is a spring which normally throws the holding-arm N of the lever L upwardly into engagement with the detents or notches on or near the periphery of the shutter.

S' is a push-rod projecting through a sleeve to the outside of the shutter-case or camera, as the case may be, where there is a push-button T. On the forward end of the push-rod S' is an upwardly-extending right-angled piece U, which engages with the short end E' of the lever E, and on the under side of the push-rod S', near its end, is a shoulder V, (shown in dotted lines,) which engages with the arm O of the lever L.

W is a toothed index-wheel controlled by a spring-pawl X, which has numerals on the side which is exposed to view through the index-opening a. (See Fig. 3.)

b is the exposure-aperture.

c c c are pins set in the face of the shutter, against which the spring-pawl F presses for actuating the shutter.

d d d are stop-pins, which at the proper time impinge against the stop M on the lever L.

e e e are notches or shoulders on the periphery of the shutter, which engage with the holding-arm N, as hereinafter described, (pins or other devices on the shutter may be substituted for these shoulders, if desired,) and f f f are similar shoulders, which at the appropriate time engage with the spring-actu-

ated pivoted pawl *g* to prevent back movement or rebound of the shutter.

h is one form of device whereby we secure time exposure. It is normally projected, so as not to arrest the shutter, by a spring *i*.

The operation of the apparatus is as follows: In Fig. 1 the parts are shown as set for an instantaneous exposure. Upon pressing the button *T* the shoulder *V* on the pushing-rod *S'*, pressing against the arm *O*, forces it forward, rocking the lever *L* and withdrawing the holding-arm *N* from engagement with the shoulder *e*. The lever *E*, then being acted upon by the spring *I* and pressing against one of the pins *c*, instantly throws the shutter around in the direction of the arrow in Fig. 1. The stop-arm *M* has by this time moved inwardly over the face of the shutter, so that the succeeding pin *d* comes in contact with it, and the rotation of the shutter, after having made the exposure, is arrested, and the pawl *g*, having by this time passed in the rear of the succeeding shoulder *f*, prevents rebound of the shutter, which might otherwise make a false exposure; and also during the forward movement of the push-rod *S'* the bar *P* is moved into engagement with one of the teeth of the index-wheel *W* and secures the rotation of that wheel one tooth—in other words, one number. Upon applying pressure upon the push-button *T* and then relieving it of pressure, the arm *M*, also the stop *N* and the arm *O* and index operating-rod *P*, are all returned to their position, as shown in Fig. 1. It will thus be apparent that the same manual act of pressing inwardly the push-button *T* first releases the mechanism for making the exposure, second, operates the index, and, third, resets the mechanism for a subsequent exposure, the last two being simultaneous.

In Fig. 4 we show an alternative construction of the shutter-throwing lever *E*. By this construction we do away with the necessity for the pivoted spring-controlled pawl *F*. The bar is made of spring-metal, so that it will easily rise. The inclined surface of the latch-like part *J* on the under side of the lever comes in contact with the pin *c*, and will ride up over them during the resetting operation. To make a time exposure, the pin *h* is pushed in immediately prior to releasing the apparatus for the exposure, and its inner end, being then pressed inwardly, moves into the path of the pins *d*, and they are so spaced that when they stop against the inner end of the pin *h* the openings *D* in the shutter will be coincident with the exposure-aperture *b*. The pin *h* will of course be retained in its inwardly-pressed position during the length of time required for the time exposure, and upon being released will be withdrawn by the spring *i*, and the shutter will then move around until stopped by the arm *M*, as above described. Any preferred form of stop may

be substituted for the pin *h* and its coacting parts.

We claim—

1. A photographic shutter combining, essentially, a rotary shutter, a stopping and holding device for the same, a motor constructed and arranged to rotate it and an index separate and distinct from the camera mechanism, and mechanism connected with the device which puts the motor under tension for operating the index, substantially as set forth.

2. The combination of a rotary shutter, stopping and holding devices for the same, a motor constructed and arranged to rotate it in one direction and an index operated by the shutter-operating mechanism, and means whereby an aperture in the shutter may be temporarily held coincident with the exposure-aperture, substantially as set forth.

3. The combination of a rotary shutter having a plurality of holes therein and an equal number of projections or engaging surfaces on the shutter against which a motor successively engages for rotating the shutter in one direction, substantially as set forth.

4. The combination of a rotary shutter, a motor to actuate the same, and a lever having at one end a stop to arrest the rotation of the shutter and at the other end a holding device to maintain the shutter against the stress of the motor, means to operate said lever, and also an arm which engages with devices for operating an index, and an index, substantially as set forth.

5. The combination of a rotary shutter, a motor to actuate the same, the stress whereof may be adjusted, and a lever having at one end a stop to arrest the rotation of the shutter and at the other end a holding device to maintain the shutter against the stress of the motor, means to operate said lever, and also an arm which engages with devices for operating an index, and an index, substantially as set forth.

6. The combination of a rotary shutter, a motor to actuate the same, the stress whereof may be adjusted, and a lever having at one end a stop to arrest the rotation of the shutter and at the other end a holding device to maintain the shutter against the stress of the motor, means to operate said lever, and an arm which engages with devices for operating an index, an index, and a device to prevent backward turning of the shutter, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 23d day of October, A. D. 1890.

FREDERICK A. ANTHONY.
WILLIAM H. LEWIS.

Witnesses:

FREDERICK SMITH,
PHILLIPS ABBOTT.