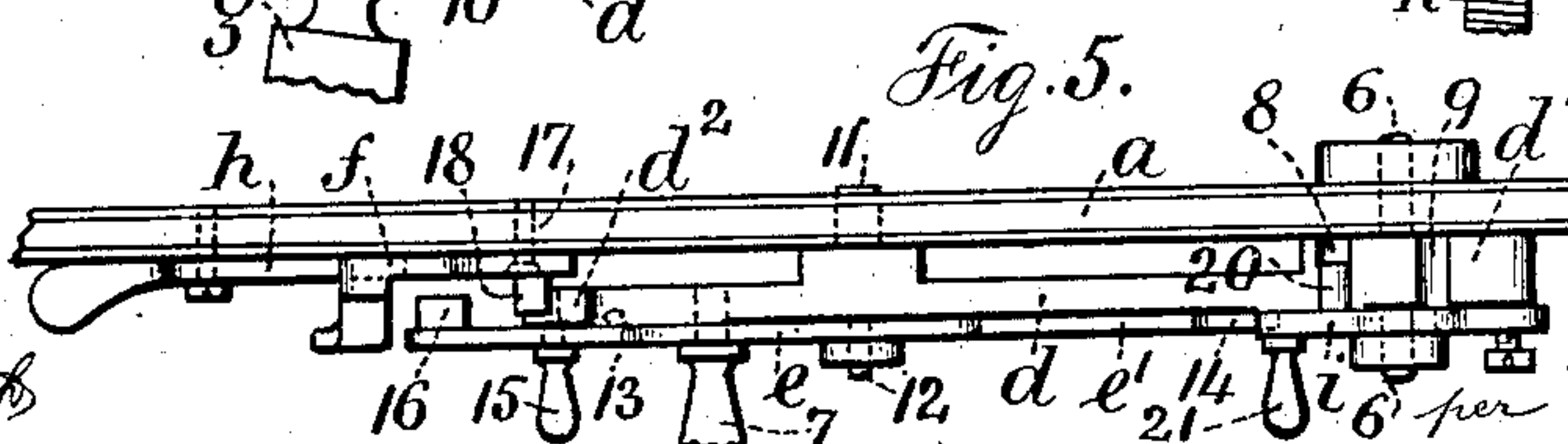
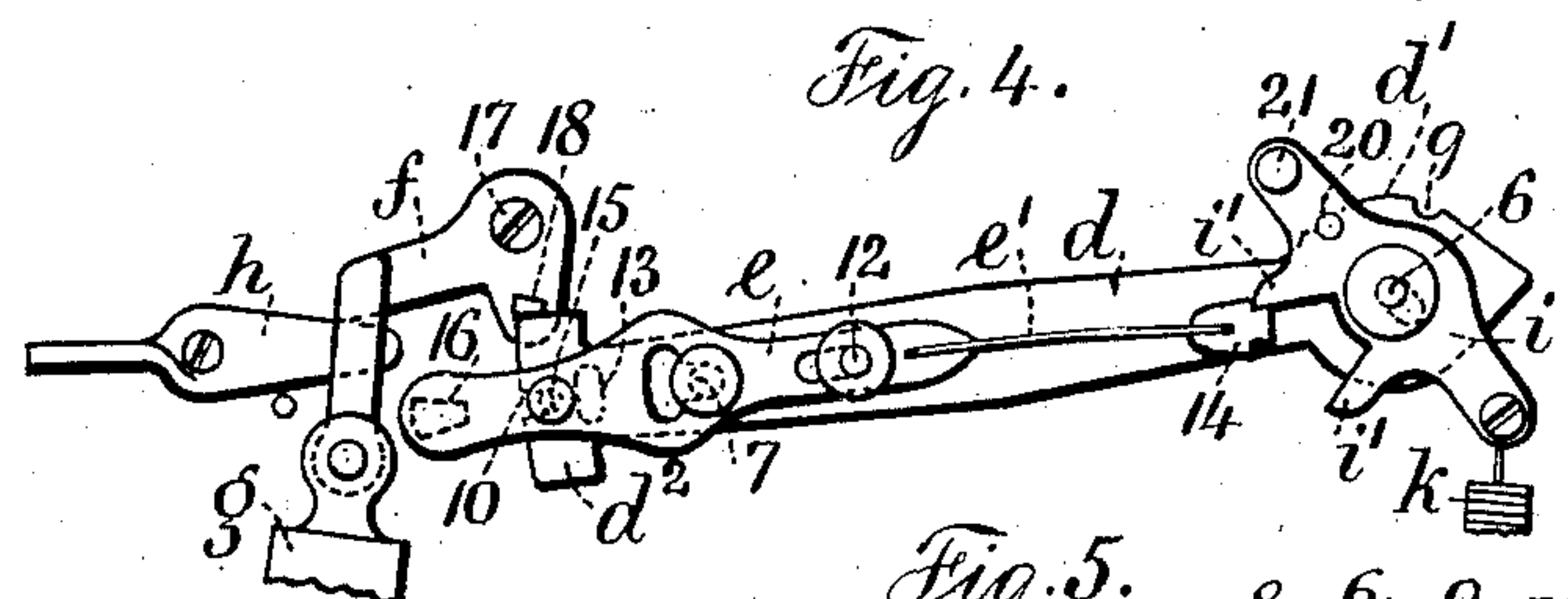
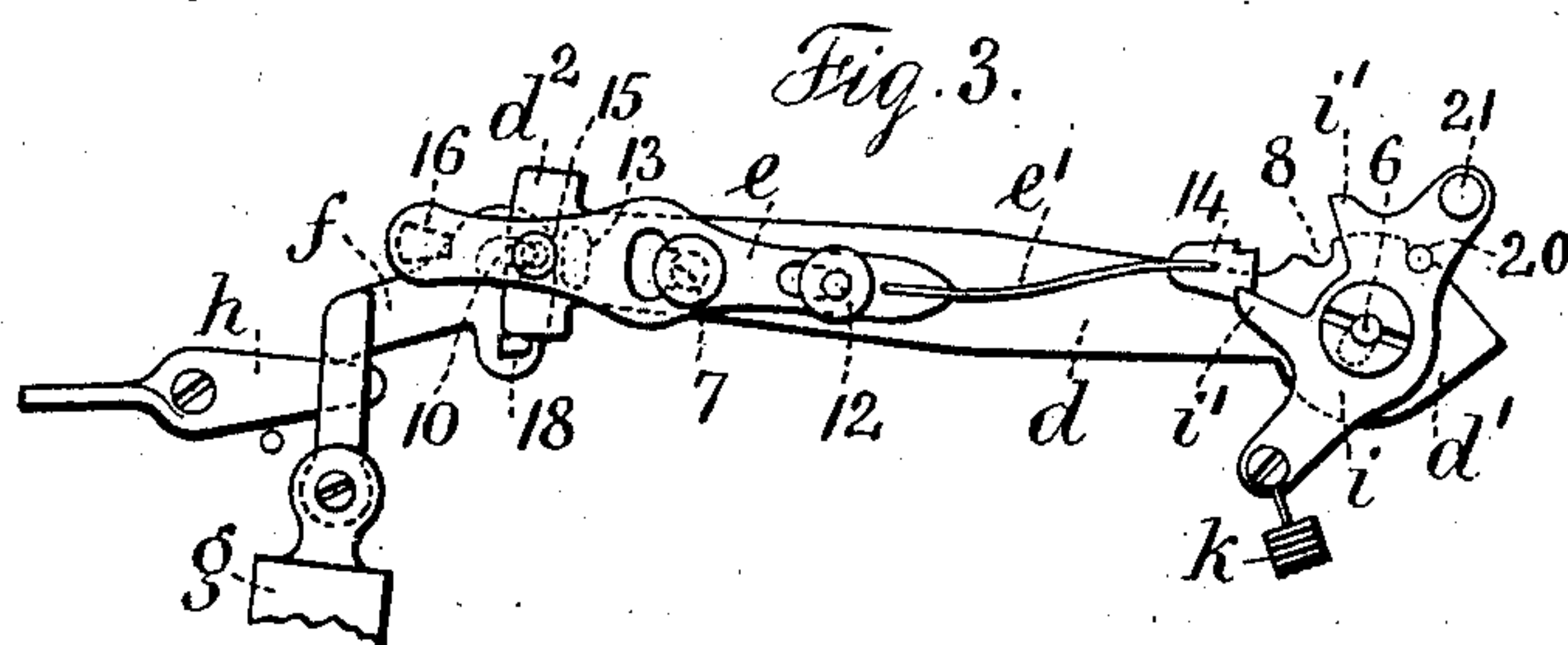
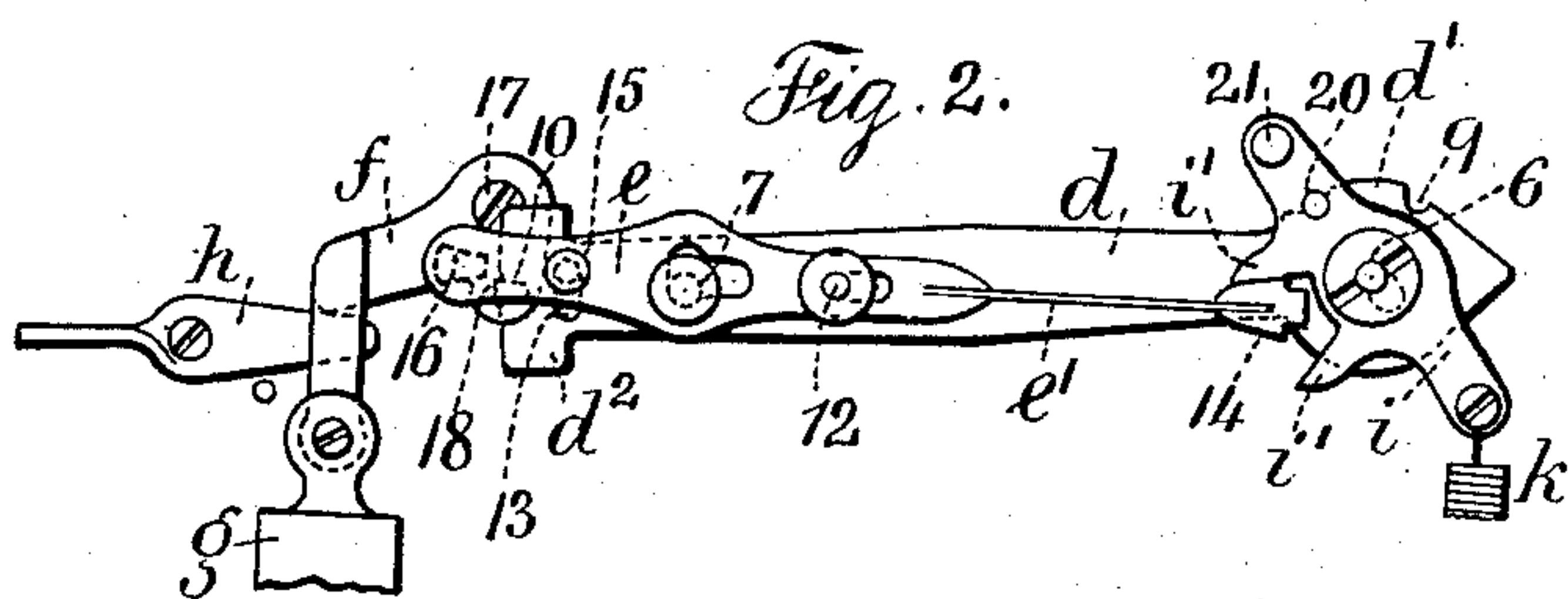
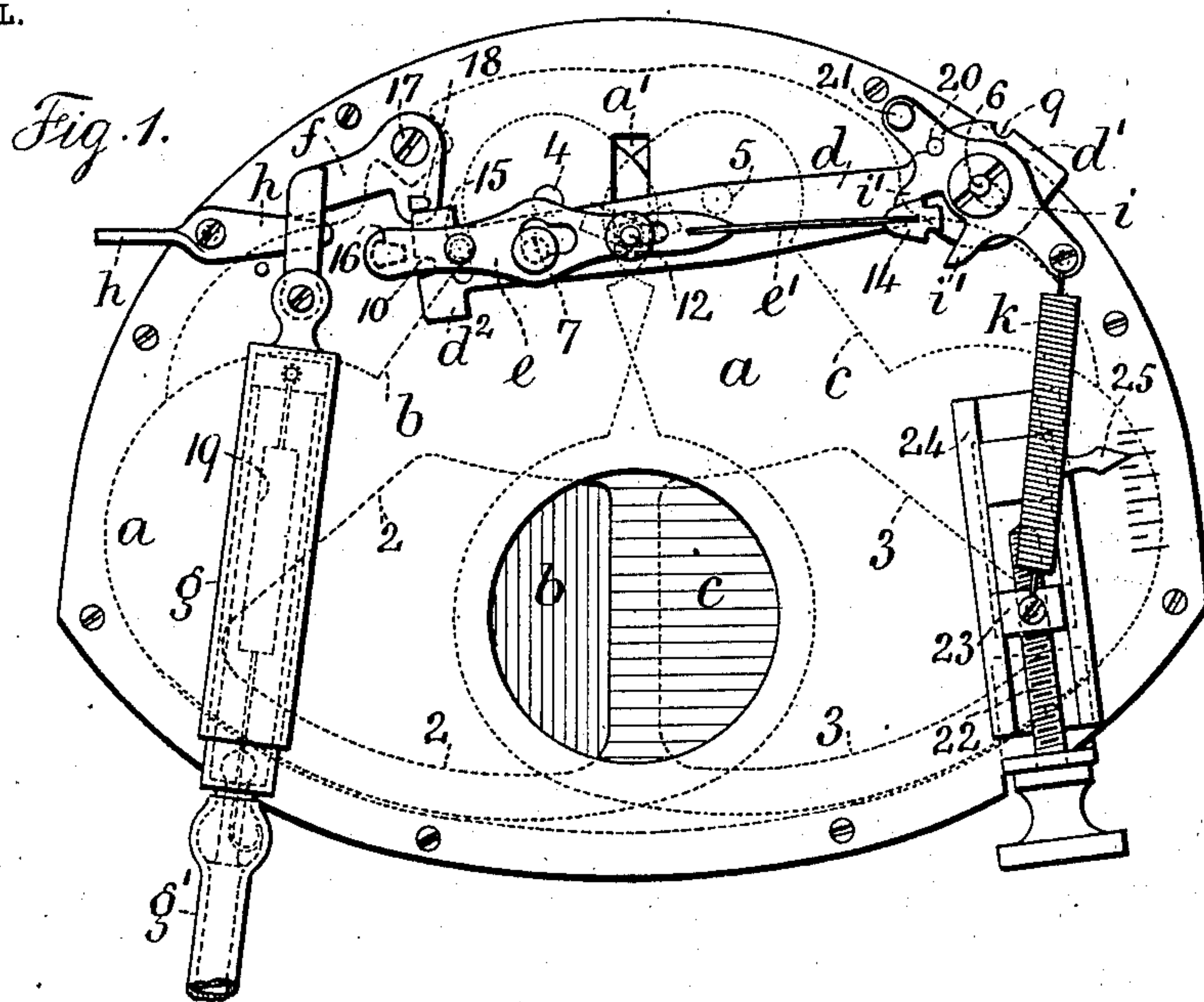


M. KLAIBER.
 PHOTOGRAPHIC SHUTTER.
 APPLICATION FILED OCT. 18, 1902.

NO MODEL.



Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

MAXIMILIAN KLAIBER, OF BROOKLYN, NEW YORK, ASSIGNOR TO PROSCH
MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION
OF NEW YORK.

PHOTOGRAPHIC SHUTTER.

SPECIFICATION forming part of Letters Patent No. 726,700, dated April 28, 1903.

Application filed October 18, 1902. Serial No. 127,762. (No model.)

To all whom it may concern:

Be it known that I, MAXIMILIAN KLAIBER, a citizen of the United States, residing at the borough of Brooklyn, in the county of Kings, city and State of New York, have invented an Improvement in Photographic Shutters, of which the following is a specification.

My present invention is designed as an improvement upon the well-known Prosch photographic shutter, covered by Letters Patent of the United States No. 352,098, dated November 2, 1886. The shutter of this patent and the modifications thereof that have been in use since the date of said patent have been especially applicable for use with lenses upon cameras adapted for glass plates, and these shutters have not been adapted for use with film-cameras, because to set such shutters the blades were always moved in the opposite to the normal direction of movement of the mechanism and the mechanism could not be operated except the blades were simultaneously operated, and this condition would not answer in a film-camera, as there the mechanism must be capable of being set to position without operating the shutter-blades or exposing the sensitive surface of the film. Of course it is to be understood that these shutters could be employed with film-cameras by using an ordinary lens-cap while shifting the mechanism; but most modern cameras do not ordinarily carry a lens-cap.

The object of my present invention is to provide a shutter-blade operative mechanism which at each extreme movement may be adjusted and set for the next movement, retaining in the device all the advantages of the well-known Prosch shutter.

In my improvement I employ, with a pair of apertured blades pivoted in a case intersecting the lens-tube and which blades are arranged to swing past each other to open and close the lens-tube, a spring-actuated lever device arranged to simultaneously actuate both blades, an auxiliary lever device longitudinally movable with reference to the lever device, a release-lever, a spring-actuated pneumatic release, and a rocking lever shiftable to one of two positions to engage the lever and auxiliary lever, and a tension device

for actuating the lever devices in either one of two directions, all of which are hereinafter more particularly described.

In the drawings, Figure 1 is an elevation representing my improvement, the mechanism being set in one position for time. Fig. 2 is an elevation of the mechanism alone in an intermediate position, at which time the opening of the shutter-blades and the coinciding of the apertures therein is made effective. Fig. 3 is an elevation of the operating mechanism in one position set for instantaneous. Fig. 4 is an elevation similar to Fig. 3, but with the parts set in the other position for instantaneous; and Fig. 5 is a plan of the mechanism in the position shown in Fig. 4.

The casing *a* of the shutter is of approximately curvilinear triangular form and usually comprises front and back plates and intermediate frame, within which there is a space for the blades *b c*. The casing is provided in both plates with coinciding vertical slots *a'*. The blades are slotted at points opposite their pivots in adjacent edges, and in proximity to the slots *a'* of the casing these blades are provided with apertures 2 3 of trapezoidal form, the adjacent vertical edges of which normally overlap to close the opening in the casing of the shutter. The blades *b c* are pivoted at 4 5 to the casing. A lever *d*, having a hub *d'*, is pivoted at one end at 6 to the case. This lever is provided with the stud 7, with a head *d*² at the end opposite to the pivot and which head is formed with upper and lower parallel flat faces. There are notches 8 9 in and transversely of the upper surface of the hub *d'*. The free end of the lever at the head *d*² is provided with an end notch 10. A stud 11, projecting about midway of the lever *d*, passes through the vertical slots *a'* of the casing and through the slots of the blade, so as to actuate said blades by swinging the same on their pivots 4 5. This lever *d* is also provided with a pin and nut 12 and with a surface recess 13.

e represents an auxiliary lever with a longitudinal mortise for the pin and nut 12, with a trefoil mortise for the stud 7. This auxiliary lever is provided with a spring end *e'* and head 14 on the free end of the spring.

with opposite end notches to the head. There is a stud 15 secured to said auxiliary lever and projecting from the outer face, said stud having on the opposite side of said lever a slight prolongation adapted to enter the recess 13 of the lever *d*, and secured to the inner surface of said auxiliary lever and at the end thereof is a lug 16.

f is a release-lever pivoted at 17 to the case *a*, at one end provided with a lug 18 and at the other end pivoted to the barrel of the pneumatic release *g*. This pneumatic release is provided with an internal contractile spring 19, (shown in Fig. 1 by dotted lines,) and to this pneumatic release *g* is connected a rubber tube *g'*, extending from a usual hand-bulb.

h represents a finger release and stop secured to the case *a*.

The opposite ends of the spring 19 are secured, respectively, to the inner ends of the telescoping barrels of the pneumatic device.

A rocking lever *i* is provided with a central mortise and is pivoted to the pivot 6 of the lever *d*, and this mortise permits a slight longitudinal movement of the rocking lever. This rocking lever is provided with jaws *i'*, with a pin 20, adapted to be placed in either one of the notches 8 9 of the hub *d'*, and a finger-stud 21, projecting from the outer surface of the rocking lever *i*, may be grasped by hand to move the rocking lever longitudinally and to swing the same in changing its position.

k represents an actuating-spring of helical form, at one end connected to one end of the rocking lever *i* and at the other end to a tension device, which is preferably made regulatable and adjustable and may be of any ordinary or desired construction without departing from my invention. For the purpose of illustrating an operative structure I have shown the tension device as comprising a screw-stem and nut 22 in a slide-block 23, movable in ways 24 and carrying a pointer 25 moving over a scale upon the casing *a*, the nut of the screw-stem bearing against part of a bracket secured to the back of the case *a*, so as to move the slide-block 23 longitudinally of the ways to change the position of the pointer and to apply more or less tension to the actuating-spring *k*.

The operation of the structure is as follows, with reference to Figs. 1 and 2: In the position of the mechanism, Fig. 1, the shutter is set for time exposure, the lug 18 resting upon the top face of the head *d*² of the lever and holding the same down with the shutter-blades closed. In this position the pin 20 of the rocking lever is in the notch 8 of the hub *d'*, and the jaw of said rocking lever bears upon the upper face of the head 14, and the lug 16 comes closely adjacent to the end surface of said head *d*². The action at this moment of the pneumatic release *g* swings the lever *f*, moves the lug 18 off the face of the head *d*², and permits the spring *k* to swing the

lever *d* upward and through the stud 11 move the shutter-blades toward one another. With this upward movement the lug 18 strikes the lug 16, causing the auxiliary lever *e*, by virtue of its spring end *e'*, to yield sufficiently for the lug 18 to come opposite the notch 10 and simultaneously to slide off the lug 16 and enter the notch 10 in the end of the head *d*², and as soon as the lug 18 enters this notch and passes off the lug 16 the spring *e'* returns the auxiliary lever to a normally straight line position, the parts at this moment being represented by Fig. 2, in which it will be seen that the lug 16 is now above the position occupied in the notch 10 by the lug 18. The next movement of the pneumatic release withdraws the lug 18 from the notch 10, releasing the lever *d*, so that the spring *k* completes the upward movement of the lever *d*, again closing the blades. The return movement of these parts for time exposure is effected by a slight longitudinal movement of the rocking lever *i*, in which the pin 20 is moved out of the notch 8, the lever swung over, and the pin 20 placed in the notch 9, this position of the lever *per se* being shown in Fig. 3, and when the parts are in this position similar movements to those hereinbefore described are effected by the progressive movement of the pneumatic release. The special function in this movement of the internal contractile spring 19 is to effect in the release-lever *f* the opposite movement to that possible by the simple pneumatic device, thereby causing the lug 18 to enter the notch 10 and the parts to be held in that position until a second action of the pneumatic release.

To adjust the mechanism hereinbefore described for instantaneous operation, the auxiliary lever *e* is moved longitudinally of the lever *d*, so as to bring the lug 16 away from the end face of the lever adjacent to the notch 10 and to bring the head 14 of said lever where one of its end notches may be engaged by the end of one jaw of the rocking lever *i*. Fig. 4 represents the parts in their relation set for instantaneous in a position analogous to that shown in Fig. 1, and Fig. 5 is a plan of the parts shown in Fig. 4. In this position the lug 18 bears upon the upper face of the head *d*², and from the plan view it will be noticed that there is now an appreciable space between the end of this head and the end of the lug 16, through which with the movement of the parts the lug 18 may freely pass, so that with the action of the pneumatic release *g* the lug 18 is moved off the surface of the head *d*², releasing the lever, permitting the spring *k* to swing the lever upward, so that a complete movement of the lever is effected, the lug 18 passing between the head and the lug 16 and the lever moving up into the position shown in Fig. 3, so that at the completion of the movement with the release of the pneumatic device the spring 19 draws the lug 18 into position against the under surface of the head

d^2 to hold the blades of the shutter in a closed position. At the end of the movement the finger-stud 21 of the rocking lever i is grasped by hand, the rocking lever given a slight longitudinal movement to lift its pin 20 out of the notch 8 to swing the same from the position Fig. 4 to the position Fig. 3, where the pin 20 is placed in the notch 9 of the hub d' and the other jaw of the rocking lever engages the other notch of the head 14 of the auxiliary lever. The engagement of the head 14 in this manner with the jaws of the rocking lever serves to hold said lever e in position and prevent a possible longitudinal movement. At the same time the action of the spring e' of said lever, together with the action of the spring k , performs the function of holding the pin 20 in either the notch 9 or the notch 8. From the position of the parts Fig. 3 a further action of the pneumatic release g swings the lever f , withdraws the lug 18 away from the under face of the head d^2 , releases the lever d , and permits the spring k to draw the lever down and actuate the shutter-blades to give an exposure. During this movement the lug 18 passes between the lug 16 and the end of the lever d , and at the completion of the movement the contractile spring 19 returns the lever f and the lug 18 to the position of said parts *per se* as shown in Fig. 4, preparatory to a change of position of the rocking lever, so as to repeat the movements hereinbefore described. It will thus be apparent that the shutter mechanism can be set at either of its extreme movements for the return movement either for time or for instantaneous without shifting the shutter-blades or exposing the sensitive surface of the film in the camera, thus adapting the shutter for use with film-cameras.

I claim as my invention—

1. In a photographic shutter, the combination with the case, a pair of apertured pivoted blades and a lever pivoted to the case and having an operative connection with said blades, of a pneumatic device for holding and releasing the pivoted lever, means coacting with the pivoted lever and adapted to be set for time or for instantaneous operation, and a tension device coacting with said latter means for actuating the pivoted lever and the shutter-blades.

2. In a photographic shutter, the combination with the case, a pair of apertured pivoted blades and a lever pivoted to the case and having an operative connection with said blades, of a spring-controlled pneumatic release adapted to hold the pivoted lever in its opposite extreme and intermediate positions and to release the same, means coacting with the pivoted lever and adapted to be set for time or for instantaneous operation, and a tension device coacting with said latter means for actuating the pivoted lever and the shutter-blades.

3. In a photographic shutter, the combination with the case, a pair of apertured pivoted

blades and a lever pivoted to the case, and having an operative connection with said blades, of a pneumatic release, a pivoted device actuated thereby and adapted to engage the lever at either of its extreme positions, a longitudinally-movable auxiliary lever connected to the aforesaid lever, a rocking lever coacting with the said pivoted and auxiliary levers and adapted to be set in one of two positions, a tension device connected to and coacting with the rocking lever for actuating the shutter through the intervention of said rocking lever.

4. In a photographic shutter, the combination with a case and pivotally-connected apertured blades, of a lever pivoted to the case, and means connected with the lever and engaging said blades for swinging the same to give the exposure, said pivoted lever having a hub with transverse adjacent notches, a head portion on the free end of said lever having flat upper and lower faces, and a notch in the end of said head portion, a device connected to, longitudinally movable of and coacting with said pivoted lever, a pneumatic release device operating at one end of said pivoted lever and coacting device, and means at the pivoted end of said lever coacting with said lever and controlled in its position by the notches of the hub of said lever, and a tension device coacting with the latter device for effecting the movements of the shutter-blades.

5. In a photographic shutter, the combination with a case and pivotally-connected apertured blades, of a lever pivoted to the case, and means connected with the lever and engaging said blades for swinging the same to give the exposure, said pivoted lever having a hub with transverse adjacent notches, a head portion on the free end of said lever having flat upper and lower faces, and a notch in the end of said head portion, an auxiliary lever connected to and longitudinally movable of said pivoted lever, a spring-blade at one end of said auxiliary lever, a notched head carried thereby and a lug at the other end of said auxiliary lever, and a means for preventing accidental longitudinal movements of the levers with relation to one another, a lug 18 adapted in one position of the mechanism for contacting with the lug of the auxiliary lever and entering the notch in the end of the pivoted lever for determining the time-open position of the shutter, pneumatic release devices for actuating the lug; devices connected to the pivoted lever and coacting therewith and with the auxiliary lever and a tension device for actuating the parts to effect the movements of the shutter.

6. In a photographic shutter, the combination with a case and pivotally-connected apertured blades, of a lever pivoted to the case, and means connected with the lever and engaging said blades for swinging the same to give the exposure, said pivoted lever having a hub with transverse adjacent edges, a head

portion on the free end of said lever having flat upper and lower faces, and a notch in the end of said head portion, an auxiliary lever connected to and longitudinally movable of
 5 said pivoted lever, a spring-blade at one end of said auxiliary lever, a notched head carried thereby and a lug at the other end of said auxiliary lever, and a means for preventing accidental longitudinal movements of the le-
 10 vers with relation to one another, a lug 18 adapted in one position of the mechanism for contacting with the lug of the auxiliary lever and entering the notch in the end of the piv-
 15 oted lever for determining the time-open position of the shutter, pneumatic release devices for actuating the lug, and a rocking lever having jaws adapted to engage the head
 20 of the auxiliary lever, and means for determining the position of the rocking lever with relation to the pivoted lever, and a tension device coacting with the rocking lever for ef-
 25 fecting the movement of the parts and actuating the blades of the shutter.

7. In a photographic shutter, the combina-
 25 tion with a lever pivoted to the case and having a notch in the outer surface of its free end, a lug 16 and a support therefor coacting with said pivoted lever, a lug 18, a pivoted sup-
 30 port therefor, a pneumatic release device and coacting spring for actuating the lug 18 and thereby releasing the pivoted lever so that the same may contact with the lug 16 and en-
 35 ter the notch of the pivoted lever or be withdrawn therefrom, substantially as set forth.

8. In a photographic shutter, the combina-
 35 tion with a pivoted lever and pneumatic and release mechanism for holding and releasing said pivoted lever, of a longitudinally-mov-
 40 able auxiliary lever comprising a main portion connected to the pivoted lever, a spring-blade at one end and a head at the free end of the spring with opposite notches, a lug 16
 45 at the other free end of said auxiliary lever coacting with the pneumatic release mechanism, a rocking lever adapted for slight longi-
 50 tudinal movement and connected to the pivot of the pivoted lever and having jaws adapted to engage the head of the blade-spring of the
 55 auxiliary lever, and devices for determining the position of the rocking lever with reference to the hub of the pivoted lever, an actu-
 60 ating-spring and tension device coacting with the rocking lever and the pivoted lever for effecting the movement of the shutter-blades,
 65 substantially as set forth.

9. In a photographic shutter, the combina-
 60 tion with the pivoted lever d having a hub d' with transverse surface notches 8, 9 and a
 65 rocking lever i pivotally connected to the bearing of the lever d and having an appreciable mortise at said point providing for a
 slight longitudinal movement thereof, a pin 20 adapted to engage the notches 8, 9 in the
 respective positions of the rocking lever with
 reference to the lever d , and means coacting
 with said rocking lever in its respective po-

sitions for swinging the pivoted lever d up or down, substantially as set forth.

10. In a photographic shutter, the combina-
 70 tion with the pivoted lever d having a hub d' with transverse surface notches 8, 9 and a
 rocking lever i pivotally connected to the bearing of the lever d and having an appreciable mortise at said point providing for a
 75 slight longitudinal movement thereof, a pin 20 adapted to engage the notches 8, 9 in the
 respective positions of the rocking lever with reference to the lever d , an actuating-spring
 80 k at one end pivoted to the rocking lever, and an adjustable tension device to which the
 other end of said spring is connected.

11. In a photographic shutter, the combina-
 85 tion with the pivoted lever d , a rocking lever i connected to the pivot of said lever d , means for connecting said parts in their respective
 positions, a spring and tension device acting thereon for moving said lever up or down, a
 pneumatic release device for holding the piv-
 90 oted lever in either of its up or down positions and releasing the same, and a device connect-
 ed to the pivoted lever d and adjustable longitudinally thereof and which in one of its
 positions contacts with the rocking lever i at
 95 one end and with the pneumatic release structure at the other end for effecting the time
 movements of the shutter and which in its other position is held by the rocking-lever
 device and is free of contact with the pneu-
 100 matic release device at the other end to provide for the instantaneous movements of the
 shutter.

12. In a photographic shutter, the combina-
 105 tion with the pivoted lever d , a rocking lever i connected to the pivot of said lever d , means for connecting said parts in their respective
 positions, a spring and tension device acting thereon for moving said lever up or down, a
 pneumatic release device for holding the piv-
 110 oted lever in either of its up or down positions and releasing the same, a device connected to
 the pivoted lever d and adjustable longitudinally thereof, a stud at one end and a notched
 head at the other end, said head bearing upon the rocking lever and the stud at the other
 115 end engaging the pneumatic release device for effecting the time movements of the shut-
 120 ter, and in the other position of the device the notched head is engaged by the rocking
 lever and its lug on the other end is free of the pneumatic release device to permit the
 instantaneous movements of the shutter, sub-
 125 stantially as set forth.

13. In a photographic shutter, the combina-
 125 tion with the pivoted blades, a pivoted lever, coacting means between the lever and blades
 whereby the blades are actuated, a spring and adjustable means for applying tension thereto
 and a device interposed between the spring
 130 and the lever and coacting therewith and adjustable so as to occupy one of two positions
 with reference to the lever for moving the lever either up or down according to the posi-

tion of said device at the pleasure of the operator, substantially as set forth.

14. In a photographic shutter, the combination with the pivoted blades, a pivoted lever
5 and coacting devices between said parts whereby the blades are actuated by the movement of the lever, of a pneumatic release device adapted to hold the lever in either of its
10 respective positions and to release the same, a device movable longitudinally of the pivoted lever in one position adapted to contact with the pneumatic release device and immediately arrest the movement of the pivoted lever and then release the same and in the

other position to allow free movement for the
pneumatic release device, a spring tension device and a device coacting therewith and with
the pivoted lever and which device engages the
device longitudinally movable of the pivoted
lever to control the same in its respective
20 longitudinal positions to insure and make effective the movements of the shutter, substantially as set forth.

Signed by me this 16th day of October, 1902.

M. KLAIBER.

Witnesses:

GEO. T. PINCKNEY,
S. T. HAVILAND.