

N<sup>o</sup> 6238



A.D. 1912

*Date of Application, 13th Mar., 1912—Accepted, 13th Feb., 1913*

COMPLETE SPECIFICATION.

**Improvements in Shutters for Photographic Cameras.**

We, THE THORNTON-PICKARD MANUFACTURING COMPANY LIMITED, of Altrincham, County of Chester, Photographic Apparatus Manufacturers, ARTHUR GRAY PICKARD, Director of the said Company, and FRANK SLINGER, Foreman with the said Company, do hereby declare the nature of this invention and in  
5 what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to mechanism for setting and releasing roller blind shutters known as focal plane shutters in which the width of the slit or aperture  
10 in the blind is varied to determine the length of exposure, the aperture being made as the shutter is being set by the upper blind being caused to move independently a distance corresponding to the desired aperture and the aperture being closed after exposure by the upper blind being caused to independently continue its traverse after the lower blind has been brought to rest and until its lower edge has overlapped the lower edge of the upper blind.

15 In such shutters the upper blind is mounted upon a setting roller at the top of the shutter and has tapes connected thereto which are brought down the sides of the shutter and attached to a spring roller at the bottom of the shutter and the lower blind is mounted upon a spring roller at the bottom of the shutter and has tapes connected thereto which are brought up the sides of the shutter,  
20 and are attached to a setting roller at the top of the shutter. The two upper winding rollers carry pinions geared to two setting wheels on a common axle such wheels being locked together during the exposure movement of the blinds and then unlocked to permit of the closing of the aperture between the blinds.

The object of the invention is to obtain the alteration of the size of the slit,  
25 as well as the resetting of the shutter for bulb exposure by the single operation of turning the winding knob a less or greater extent and the invention consists in the construction and arrangement of mechanism for connecting the two setting wheels to cause them to rotate together and for releasing them to permit of one rotating independently of the other when required.

30 The invention will be fully described with reference to the accompanying drawings which for the sake of clearness of detail are drawn to a scale double natural size.

Fig. 1. Side elevation of the shutter mechanism when the blind is closed and not set.

35 Fig. 2. Side elevation of same when the blind is wound up and set for instantaneous exposure.

Fig. 3. Side elevation of same when the blind is wound up and set for "bulb" exposure.

Fig. 4. Side elevation of same when the blind is open for "bulb" exposure.

40 Fig. 5. Side elevation of the setting wheel B.

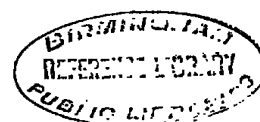
Fig. 6. Plan of the setting wheels B and B<sup>1</sup>.

Fig. 7. Details of the setting wheels.

Fig. 8. Front elevation of Fig. 1.

The blind A is of the ordinary form in two parts the upper part *a* being

[Price 8d.]



*Improvements in Shutters for Photographic Cameras.*

attached to and capable of being wound upon the setting roller  $a^2$  and connected to the spring roller  $a^4$  by tapes; and the lower part  $a^1$  being attached to the spring winding roller  $a^5$  and connected to the setting roller  $a^3$  by tapes. The spring winding rollers  $a^4$  and  $a^5$  act independently of one another but the springs are preferably geared together so as to be tightened and released simultaneously to maintain the springs at the same tension. 5

The setting roller  $a^2$  of the upper blind  $a$  is fitted with a pinion  $b$  and the setting roller  $a^3$  of the lower blind  $a^1$  with a pinion  $b^1$  which are in gear respectively with two setting wheels B and B<sup>1</sup>.

The setting wheels B and B<sup>1</sup> are arranged to rotate together for a portion of a revolution rotating the setting rollers  $a^2$  and  $a^3$  and setting the upper blind  $a$  and the lower blind  $a^1$  simultaneously after which the setting wheel B can be rotated to a further extent and with it the setting roller  $a^2$  to set the edge of the upper blind  $a$  at any desired distance from the edge of the lower blind  $a^1$  or in other words to regulate the width of the exposure slit in the blind. 15

The setting wheel B is mounted on a stud  $b^2$  and is rotated by a knob C secured to the boss by a pin or screw  $c$ . On the face of the wheel B a stud or pin  $d$  is affixed and a number of holes or preferably a number of ratchet teeth or indentations  $e$  are formed the purpose of which will be subsequently described. 20

The second setting wheel B<sup>1</sup> is mounted upon the boss of the wheel B and through it an opening or concentric slot  $d^1$  is pierced to receive the stud  $d$  on the face of the wheel B. A spring controlled catch D is pivoted to the face of the wheel B<sup>1</sup> at one end of the slot  $d^1$  to engage the end of the stud  $d$  which projects through the slot. A ratchet notch or tooth  $f$  is formed in the periphery of the wheel B<sup>1</sup> with which a releasing pawl F engages to hold it when set against the tension of the springs of the winding rollers  $a^4$  and  $a^5$ . A pawl E is pivoted on the face of the wheel B<sup>1</sup> and the end  $e^1$  projects through a hole in the wheel to engage the holes or ratchet teeth  $e$  in the face of the wheel B, for the purpose of locking the wheel B when set to the wheel B<sup>1</sup> and hold it against the tension of the springs of the winding roller  $a^4$  of the upper blind  $a$  through the wheel B<sup>1</sup> and releasing pawl F. 25 30

The pawl E is provided with a projecting pin  $e^2$  and an inclined plate G is fitted at one side of the wheel over which the pin  $e^2$  travels at the end of the rotation of the wheel B<sup>1</sup> to release the wheel B and permit of it being rotated sufficiently to close the slit between the blinds. The rotation of the wheel B<sup>1</sup> is limited by a stop  $g$  against which the pin  $e^2$  strikes or instead a stop pin  $g^1$  may be fitted to the wheel to engage the stop  $g$ , and the rotation of the wheel B is limited by the stud  $d$  reaching the end of the concentric slot  $d^1$ . On the face of the wheel B<sup>1</sup> there is also pivoted a U shaped tumbler H which when the wheel B has nearly made a complete revolution and the stud  $d$  reaches the end of the concentric slot  $d^1$  is caught by the pin  $d$  and turned into a horizontal position to engage a suitably placed stop lever K to arrest the rotation of the wheels for a "bulb exposure". 35 40 45

At one side of wheel B<sup>1</sup> a disengaging piece or stationary block L is fitted against which the spring controlled catch D contacts when the wheels B and B<sup>1</sup> have made half a revolution to disengage the catch from the pin  $d$  and allow the rotation of the wheel B to proceed to further wind up the upper blind to give the desired size or width to the exposure aperture between the edges of the two blinds. 50

The mechanism before being set and the shutter closed is in the position shown in Fig. 1. To set it for instantaneous exposure the knob C is turned in the direction of the arrow and turns the setting wheel B with it; and the pin  $d$  in the slot  $d^1$  by reason of being caught by the spring catch D, carries the second setting wheel B<sup>1</sup> round at the same time until they have made half a revolution and the pawl F drops into the ratchet notch  $f$ . This movement draws the edges of both the upper and lower parts  $a$   $a^1$  of the blind A across the focal 55

*Improvements in Shutters for Photographic Cameras.*

plane without separating them or opening the exposure slit between them. To open the exposure slit and adjust its width the knob C is turned further until the pointer end *c* of the knob C comes opposite one of the index marks *x* on the wheel B<sup>1</sup> each succeeding one indicating a wider slit. This movement  
 5 brings the spring catch D against the fixed block L by which it is moved backwards to release the pin *d* and thereby allow the setting wheel B to rotate while the setting wheel B<sup>1</sup> remains stationary the pin *d* moving along the slot *d*<sup>1</sup> until it assumes the position shown in Fig. 2. (or any other position intermediate of that shown in Figs. 1 and 3). In this position the pawl E engages  
 10 the ratchet holes or slots *e* in wheel B and prevents its rotation in the reverse direction the wheel B<sup>1</sup> being the while held by the pawl F. The additional movement of the wheel B draws back the upper blind *a* to any desired extent to widen the exposure slit or aperture between the two blinds. To release the blind for exposure the pawl is withdrawn by the end *k* of the lever K being  
 15 pressed against it or by other means. On the withdrawal of the pawl F and the release of the wheels B and B<sup>1</sup> they rotate together in the reverse direction until the movement of the wheel B<sup>1</sup> is arrested by either the pin *e*<sup>2</sup> of the pawl E or the stop pin *g*<sup>1</sup> striking the stop *g*. Simultaneously therewith the pin *e*<sup>2</sup> slides up the incline G raising the pawl E out of engagement with  
 20 the ratchet holes or notches *e* in the wheel B permitting it to continue its movement to bring the two edges of the blind together to close the slit and until the pin *d* again engages the catch D when the mechanism is again in position to be re-set for another exposure.

For a "bulb exposure" the knob C and with it the wheel B is rotated beyond  
 25 the position shown in Fig. 2 until it reaches the position shown in Fig. 3. In assuming this position the pin *d* engages the tumbler H and raises it into a horizontal position and retains it there while the wheel is released by the withdrawal of the pawl F. The movement of the lever K to withdraw the pawl throws the other end into the path of the tumbler H and arrests the rotation  
 30 of the wheel B simultaneously with that of the wheel B<sup>1</sup> by the stop *g* and the shutter remains full open so long as the lever is held in that position by the bulb or releasing lever. The movement of the lever L to its normal position frees the tumbler H and the wheel B continues its travel to close the blind aperture and return it to the position shown in Fig. 1, in readiness to be reset  
 35 for another exposure.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. In a roller blind shutter of the kind described, having two setting wheels  
 40 to control the upper and lower blinds respectively one being provided with a projecting pin and the other with a pivoted catch to engage therewith the combination therewith of a fixed block in the path of the catch to raise it and release the stud when the wheels have travelled a sufficient distance to set the lower blind, substantially as described.

45 2. In setting and releasing mechanism for roller blind shutters having two setting wheels to control the upper and lower blinds respectively the combination with the lower blind setting wheel of a catch pivoted thereto to engage a stud projecting from the upper blind setting wheel through a concentric slot in the  
 50 of the catch to release the stud when the wheel has travelled the desired distance to set the lower blind for exposure and allow the other wheel to continue its rotation to set the upper blind substantially as described.

3. A roller blind shutter constructed with a setting wheel for controlling and setting the upper blind, a setting wheel mounted thereon for controlling  
 55 and setting the lower blind, a catch on the lower blind setting wheel to engage a stud projecting from the upper blind setting wheel through a slot in the former

---

*Improvements in Shutters for Photographic Cameras.*

---

to lock the two wheels together during the setting of the shutter and a pawl pivoted to the lower blind setting wheel to engage the upper blind setting wheel and prevent its rotation in a backward direction independently of the other wheel until the pawl is raised substantially as described.

4. In setting and releasing mechanism for roller blind shutters having two setting wheels to control the upper and lower blinds respectively as in Claim 1 the combination with the lower blind setting wheel of a spring pawl pivoted thereto to engage in successive notches in the upper blind setting wheel, and a fixed inclined piece in the path of the pawl to raise it and release the upper blind wheel to permit of the further movement thereof to close the exposure slit substantially as and for the purpose described. 5 10

5. In setting and releasing mechanism for roller blind shutters having two setting wheels to control the upper and lower blinds respectively the combination with the lower blind setting wheel of a pivoted tumbler to engage a stud projecting from the upper blind setting wheel through a concentric slot in the lower blind wheel and a pivoted lever in the path of the tumbler to arrest the rotation of the wheels for "bulb exposure" 15

6. Setting mechanism for roller blind shutters as a whole substantially as described and shown.

Dated this 12th day of March, 1912.

20

J. OWDEN O'BRIEN,  
Successor to and late of W. P. Thompson & Co., of Manchester,  
Patent Agents.

[This Drawing is a reproduction of the Original on a reduced scale]

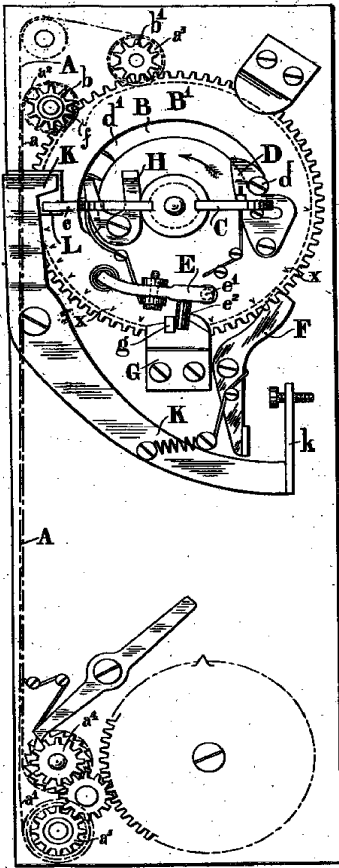


Fig. 1.

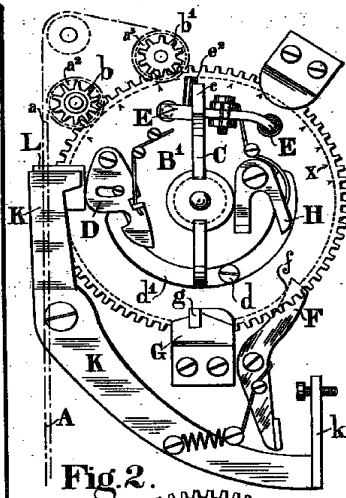


Fig. 2.

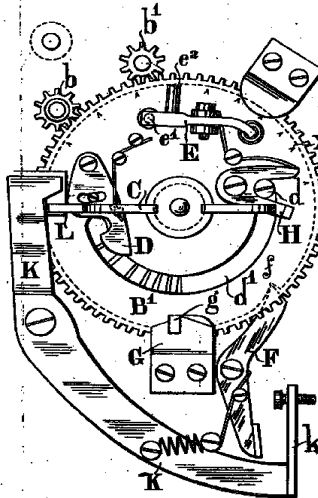


Fig. 3.

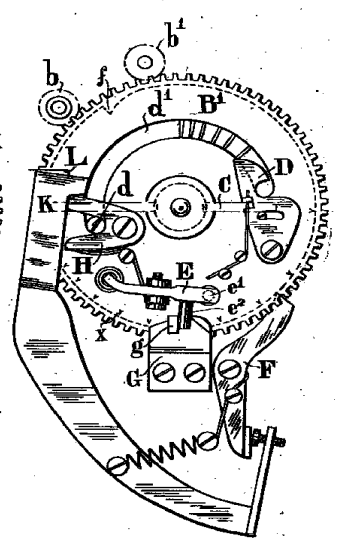


Fig. 4.

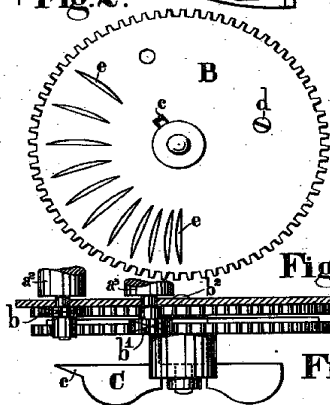


Fig. 5.

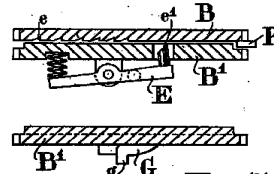


Fig. 6.

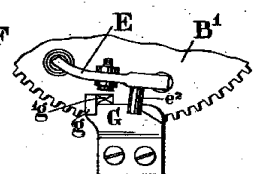
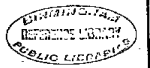


Fig. 7.



[This Drawing is a reproduction of the Original on a reduced scale.]

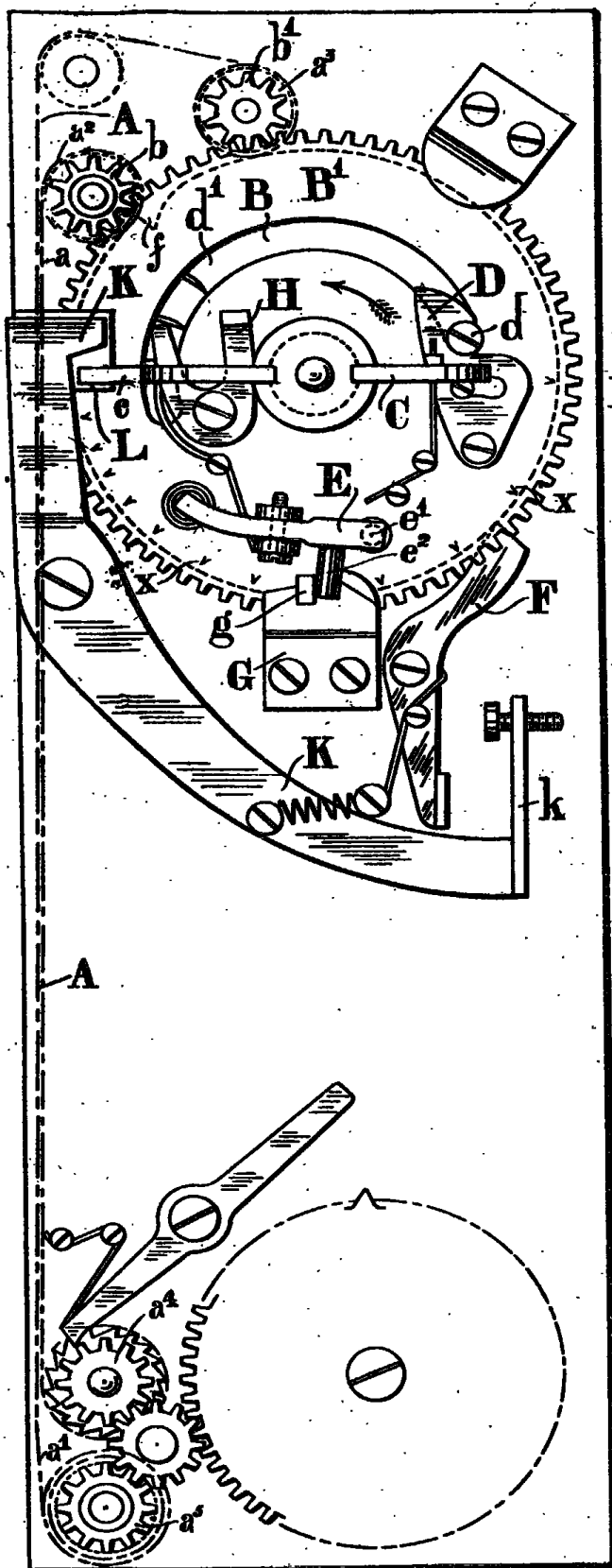


Fig. 1.

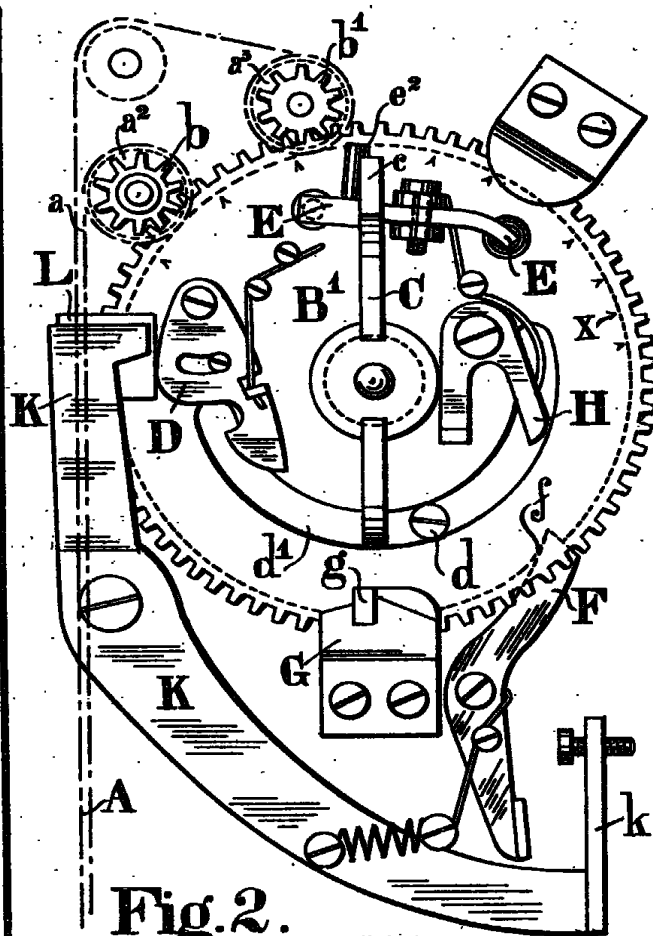


Fig. 2.

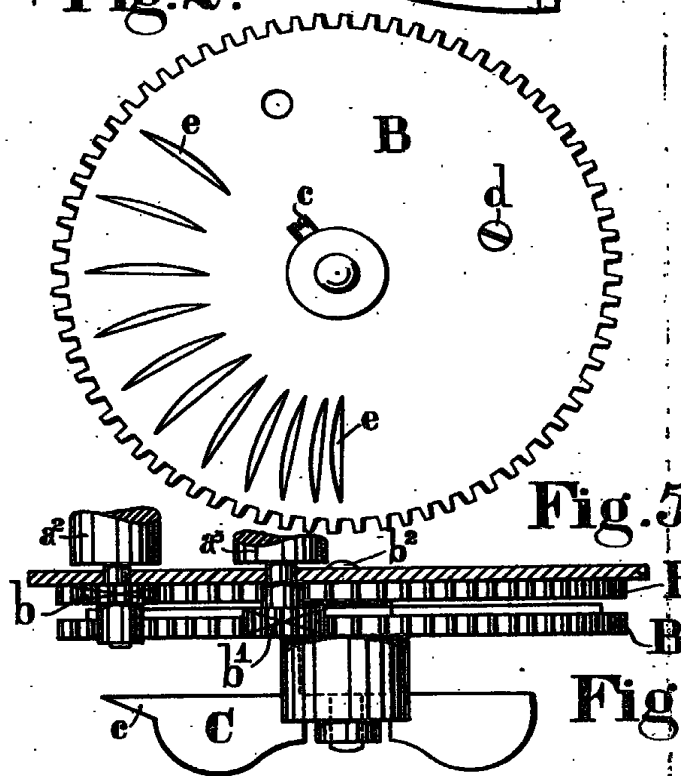


Fig. 3.

Fig. 4.

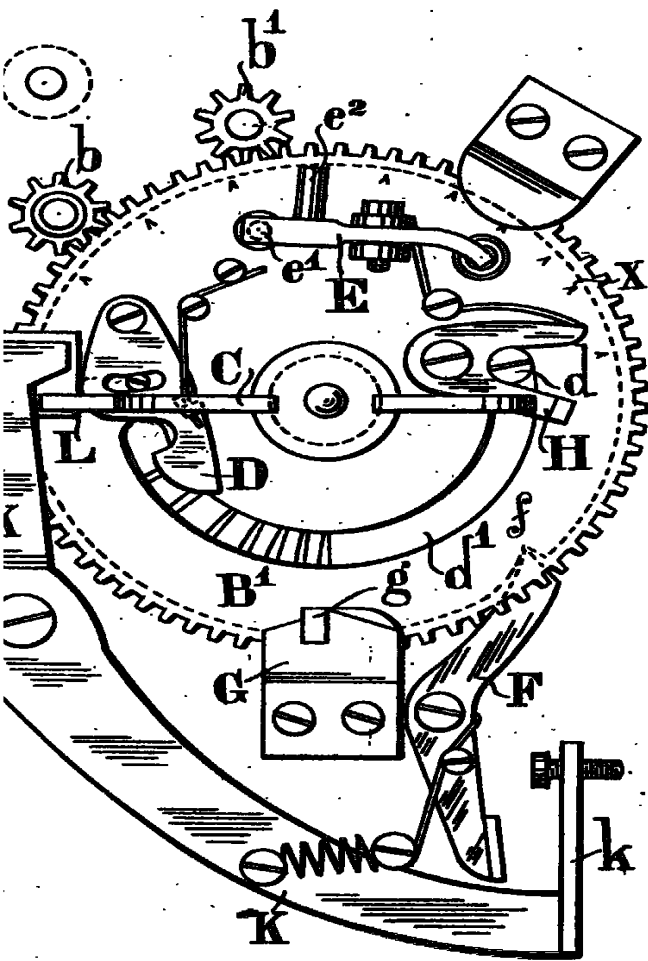


Fig. 3.

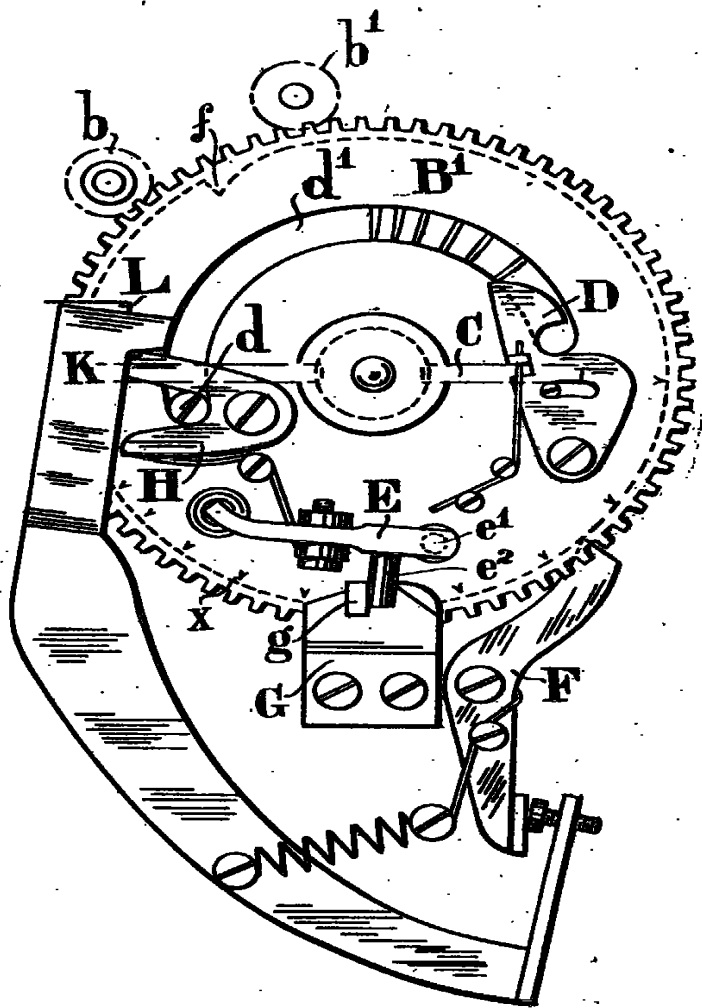


Fig. 4

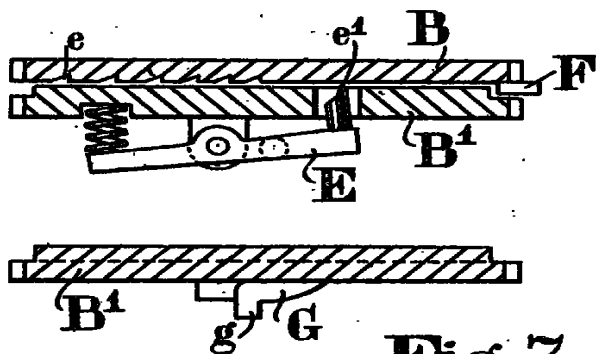
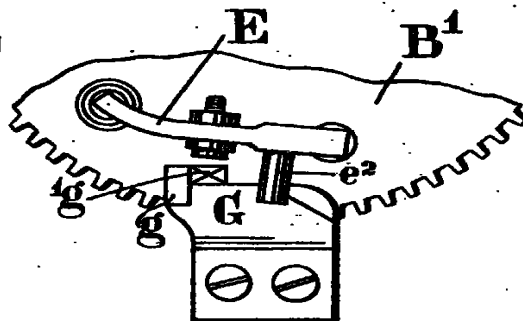


Fig. 7.



[This Drawing is a reproduction of the Original on a reduced scale.]

