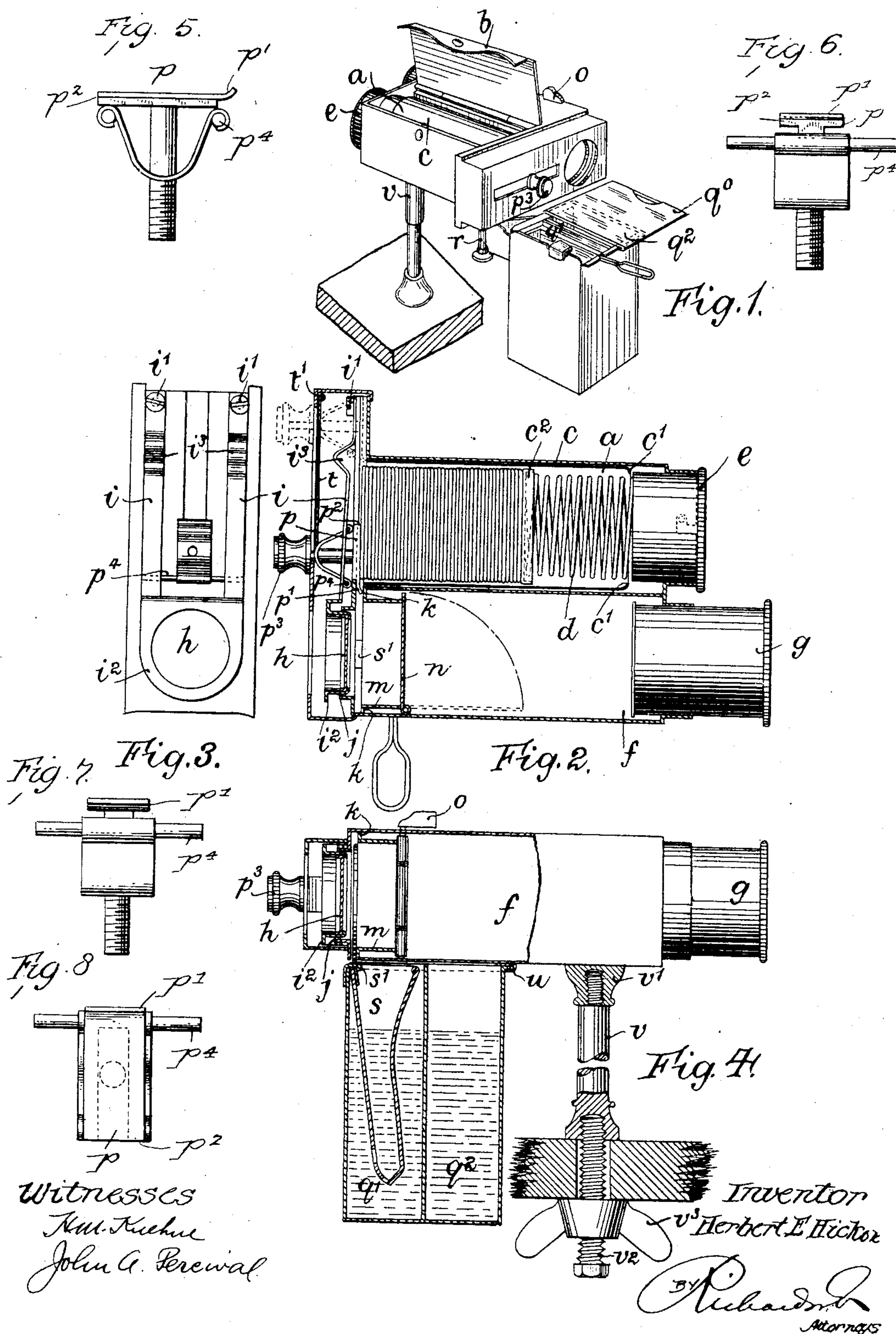


H. E. HICKOX.  
MAGAZINE PHOTOGRAPHIC CAMERA.

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# UNITED STATES PATENT OFFICE.

HERBERT EDWARD HICKOX, OF WIMBLEDON, ENGLAND.

## MAGAZINE PHOTOGRAPHIC CAMERA.

No. 832,316.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, HERBERT EDWARD HICKOX, a subject of the King of Great Britain, residing at 297 Haydon's road, Wimbledon, in the county of Surrey, England, have invented new and useful Improvements in Magazine Photographic Cameras, of which the following is a specification.

This invention relates to a magazine photographic camera which is adapted to receive in the daylight a charge of sensitized plates, to carry a focusing-screen, to convey successively the several plates from the magazine to the exposure-chamber, and in the transference to cause the plate to automatically displace the focusing-screen and occupy the situation thereof and after exposure to drop into a vessel containing a developing solution, from which it is enabled to be transferred to a bath containing the fixing solution, the entire operation being adapted to be performed without recourse to a dark-room.

The apparatus is specially adapted for the production of ferrotype positives, and an important form of construction will be one suitable for taking miniatures.

To facilitate the carrying out of the successive operations above enumerated, the following constructive features may be adopted in the several component parts, or there may be some departures therefrom, as experience may dictate. The sensitized plates are opaque or are mounted on an opaque plate, the rim of which is bent round the edge of the sensitized plate onto the front thereof, thus providing a thickness of material whereby the sensitized surface is protected from rubbing contact with the back of the adjacent plate. The plates may be round, square, or any other shape.

Referring to the accompanying drawings, Figure 1 is a perspective view showing the general arrangement and relative disposition of the parts. Fig. 2 is a horizontal section taken through the center lines of the magazine and exposure chambers. Fig. 3 is a rear view with the pivoted solution vessel and case removed. This view is drawn as projected from Fig. 2; and Fig. 4 is a partial sectional elevation. Figs. 5, 6, 7, and 8 are detail views. Fig. 1 is shown on a smaller scale than the other figures.

In these figures, *a* is the magazine-chamber, which on lifting the spring-closed lid *b* is adapted to receive a charge of sensitized

plates contained in a case *c*, the section of which is adapted to suit the profile of the plates with a sliding fit. The plates are opaque, and the sensitized surface faces in the direction toward the right in Fig. 2. The case, at the right-hand end as viewed in Fig. 2, has an inward-turned flange *c'*, whereby the plates, inserted at the left end of the case, are prevented from passing through. Before filling the case with sensitized plates a flanged disk *c*<sup>2</sup> is first inserted, the depth of the flange being somewhat more than the thickness of the rim-fortified sensitized plate. By means of the disk *c*<sup>2</sup> the terminal plate is, while it is in the case, protected from the action of light. After placing the case full of plates into the magazine-chamber *a* the lid *b* is closed and a helical spring *d* is inserted through an aperture at the right-hand end, Fig. 2, of the magazine to press on the flanged disk *c*<sup>2</sup>, the spring having sufficient flexibility, to maintain a thrust on the plates and force them toward the left-hand end of the magazine, from the first, when the magazine is full, to the last, when all the others have been expended. The helical spring *d* is retained in place by closing the right-hand end of the magazine-chamber. For this purpose a cap *e*, secured by one or more bayonet-joints, may be used. Side by side with the magazine-chamber *a* is situated the exposure-chamber *f*. This chamber is fitted at one end with a lens *g*, adapted to be adjusted in position for focusing purposes. At the other end is a translucent focusing-screen *h*. This screen is spring-mounted on the camera-case, the ends of the two arms *i i* of the spring being secured by screws *i' i'*. By means of the springs *i i* the screen is pressed into the exposure-chamber until arrested by the rim *i*<sup>2</sup> coming in contact with the edge *j* of a short tubular extension of the camera-case.

Within the exposure-chamber, very near to the left-hand end, is a partial partition *k*, having an orifice therein of the size and shape of the portion of the plate to be exposed, the distance of the partition from the near end of the exposure-chamber being just sufficient to permit for the plate an easy entrance to and exit from the compartment thereby formed. Extending from the partial partition *k* toward the lens is a short tubular extension *m*, the end of which is commanded by a shutter *n*, which is normally spring-closed, but adapted to be opened by means of a finger-



plate *o* when it is required to focus an object or expose a plate.

For the purpose of transferring a plate from the magazine-chamber to the exposure-chamber a piece *p* is provided which is adapted to slide within a slotway formed in the end plate of the magazine-chamber. The piece *p* comprises a foot having a toe *p'* and a heel *p''*, to which is secured a manipulating-knob *p'''*. To the piece *p* is secured also a pin *p''''*, the ends of which are inserted between the arms *i i* of the spring which carries the screen and the slotted guide-plate of the sliding piece *p*. When the sliding piece *p* is in the direction toward the exposure-chamber, the toe *p'* will be in contact with the rim of a plate which it is transferring from the magazine-chamber to the compartment at the end of the exposure-chamber. At the same time the heel *p''* of the foot will be pressed on by the next plate in sequence in the magazine, which plate will for the time be prevented by the heel from getting into the position from which it can be transferred to the exposure-chamber. When after completing the movement toward the exposure-chamber the sliding piece *p* is returned to the other end of the slide, the foot will slip off the back of the next plate, which has been pressing thereon, and permit the rim of that plate to take a position where it can be acted on by the toe *p'* when *p* is next pushed toward the exposure-chamber. Thus one by one the plates can be transferred from the magazine into the position for exposure. When the sliding piece *p* is in the position toward the exposure-chamber, its foot will support the next disk in the magazine-compartment on one side only, causing it to tilt relatively to that next in sequence and so present an opportunity for the leakage of light to the sensitized surface. To exclude the light under such circumstances, a blind *t* is provided, one end of which is secured at *t'* to the casing and the other end to the spindle which carries the manipulating-knob *p'''*. The blind wrinkles up loosely when the sliding piece *p* is moved toward the left, Fig. 1, and stretches tightly across the slot, as shown in Fig. 2, when piece *p* is moved in the reverse direction.

To enable the focusing to be performed with accuracy, the surface of the screen is required to occupy the exact position which will presently be filled by the sensitized film when exposed, and an important feature of this invention resides in the means for automatically displacing the screen from and replacing it in the position for correct focusing. For this purpose the arms *i i* of the spring are bent so as to form recesses *i'''*, which the ends of the pin *p''''* can temporarily occupy when the sliding piece reaches the end of its movement away from the exposure-chamber. When in this position, there is nothing to prevent the screen from being

carried by the spring into the exposure-chamber to its limiting position, and when the sliding piece is moved in the act of transferring the next plate the ends of the pin *p''''* will by interposing themselves between the arms *i i* and the slotted plate push those arms in such a way as to remove the screen outward from the exposure-chamber and out of the way of the plate which is being shifted into the operative position.

Beneath the camera-case comprising the magazine and exposure chambers is movably mounted a vessel formed with two compartments *q' q''*. This vessel is pivoted in such a way as to turn in a horizontal plane about a vertical axis *r*. In its inward operating position an outward-bent flange is received in a groove provided beneath the camera, as at *u*, Fig. 4. This serves to steady the vessel and exclude the light. The movable solution-holding vessel contains a cradle *s*, perforated at the bottom, which cradle is adapted to receive the plate just previously exposed and facilitate its transference from the compartment *q'* to the compartment *q''* when the vessel has been temporarily withdrawn from the home position beneath the camera-case. The small compartment into which the plate is thrust for the purpose of exposure has no bottom, but the plate contained therein is temporarily supported by a ledge *s'*, formed on the cradle *s*. The outward-lying edge of the ledge *s'* is bent into a hook form, whereby the cradle *s* can be hung on the edge of the solution-carrying vessel. When after the exposure of the plate the vessel is withdrawn a small distance, the plate will drop into the cradle *s*, which at the time should occupy the compartment *q'*, into which has also previously been poured a quantity of developing solution. After remaining in that solution for a sufficient interval of time the cradle and contained plate are transferred to the compartment *q''*, which contains a fixing solution. After a short time the plate should be removed and washed. The vessel is fitted with a sliding lid *q'''*, as shown in Fig. 1, which is closed when the camera is being carried from one place to another. When the magazine has become depleted, the flanged disk *c''*, above referred to, will occupy the position of the last plate, and when an attempt is made to transfer it to the exposure-chamber, the depth of its flange preventing such displacement, the fact will be made known that the magazine is empty of plates.

To enable the camera to be mounted on an ordinary camera-stand or tripod in a sufficiently elevated position to permit the developing and fixing vessels to be manipulated, a removable standard *v* is provided. It consists of three parts. The screw *v''*, which after being passed through the orifice ordinarily formed in a tripod-head, is screwed into the base of the standard proper, *v*, and secured by



a butterfly-nut  $v^3$ , the upper end of the standard being screwed into a socket  $v'$ , carried by the under side of the camera.

I claim—

5 1. A photographic camera comprising a magazine-compartment, an exposure-compartment, a spring-mounted focusing-screen, a guide forming a path for a sensitized disk, a push-piece adapted to slide in the guide, a  
10 toe on the push-piece to engage with the rim of a disk when the push-piece is at the magazine end of its path, a heel on the push-piece to support the next consecutive disk when the push-piece is at the other end of its path  
15 and a projection from the push-piece to displace the focusing-screen.

2. A photographic camera comprising a magazine-compartment, an exposure-compartment, a spring-mounted focusing-screen, a guide forming a path for a sensitized disk, a  
20 push-piece adapted to slide in the guide, a toe on the push-piece to engage with the rim of a disk when the push-piece is at the magazine end of its path, a heel on the push-piece  
25 to support the next consecutive disk, when the push-piece is at the other end of its path, a projection from the push-piece to displace the focusing-screen and a movable vessel bearing a ledge to temporarily support the  
30 disk in the exposure-compartment.

3. A photographic camera comprising a magazine-compartment, an exposure-compartment, a spring-mounted focusing-screen, a guide forming a path for a sensitized  
35 disk, a push-piece adapted to slide in the guide, a toe on the push-piece to engage with the rim of a disk when the push-piece is at the magazine end of its path, a heel on the push-piece to support the next consecutive  
40 disk when the push-piece is at the other end of its path, a projection from the push-piece to displace the focusing-screen, a movable vessel and a cradle contained therein formed with a ledge to temporarily support the disk  
45 in the exposure-compartment.

4. A photographic camera comprising a magazine-compartment, an exposure-compartment, a spring-mounted focusing-screen, a guide forming a path for a sensitized  
50 disk, a push-piece adapted to slide in the guide, a toe on the push-piece to engage with the rim of a disk when the push-piece is at the

magazine end of its path, a heel on the push-piece to support the next consecutive disk, a blind to shield the magazine end when the  
55 push-piece is at the other end of its path, a projection from the push-piece to displace the focusing-screen, a movable vessel and a cradle contained therein formed with a ledge to temporarily support the disk in the ex-  
60 posure-compartment.

5. A photographic camera comprising an exposure-chamber, a magazine-compartment, a case to fit profiles of sensitized disks having an internal flange at one end, a lid to  
65 open the compartment to permit the insertion of the case sidewise, a helical spring inserted endwise into the compartment and the case, a cap to close the end of the compartment and means for transferring the sen-  
70 sitized disks one by one from the case to the exposure-chamber.

6. A photographic camera comprising an exposure-chamber, a magazine-compartment, a case to fit profiles of sensitized disks  
75 having an internal flange at one end, a flanged disk to fit within the case, a lid to open the compartment to permit the insertion of the case sidewise, a helical spring inserted endwise into the compartment and  
80 the case, a cap to close the end of the compartment secured by a bayonet-joint and means for transferring the sensitized disks one by one to the exposure-chamber.

7. A photographic camera comprising a  
85 magazine-compartment, an exposure-compartment, a guide forming a path for a sensitized disk, means for sliding a disk along the guide from the magazine to the exposure-compartment, a solution-carrying vessel  
90 movable relatively to the camera, a ledge supported by the vessel to temporarily sustain the disk in the exposure-chamber and a standard to secure the camera to a tripod-head at a height enabling the solution-carry-  
95 ing vessel to be operated.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HERBERT EDWARD HICKOX.

Witnesses:

H. D. JAMESON,  
F. L. RAND.