No. 668,090. Patented Feb. 12, 1901.

E. R. BULLARD.

LOCKING DEVICE FOR LENS CARRIAGES OF CAMERAS.

(Application filed June 18, 1900.)

(No Model.)

Fig. 1.

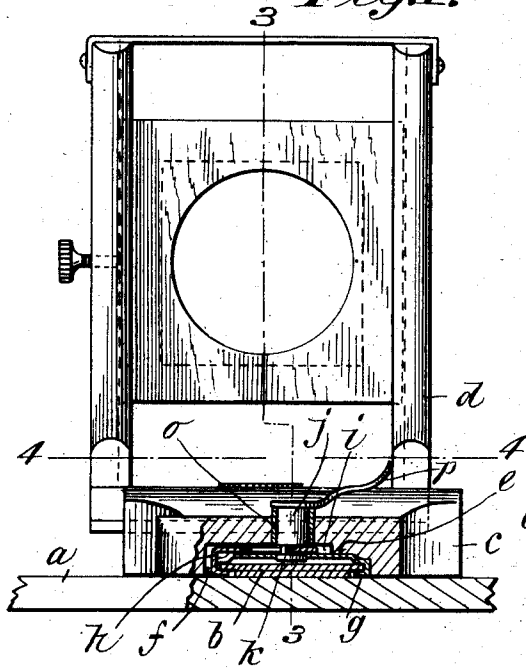


Fig. 2.

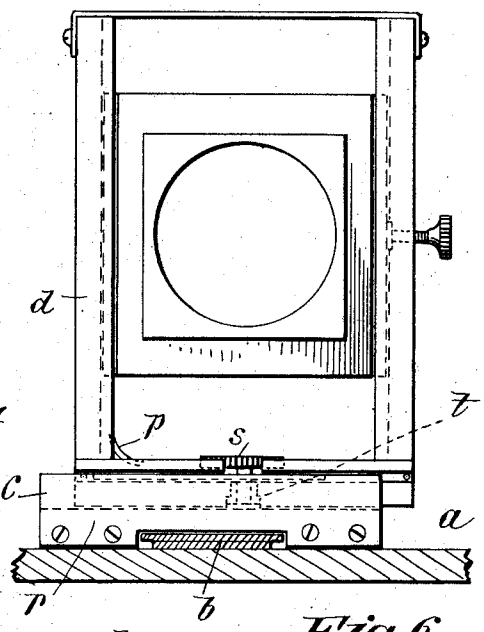


Fig. 6.

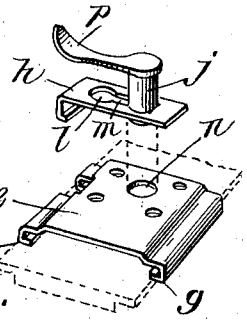


Fig. 4.

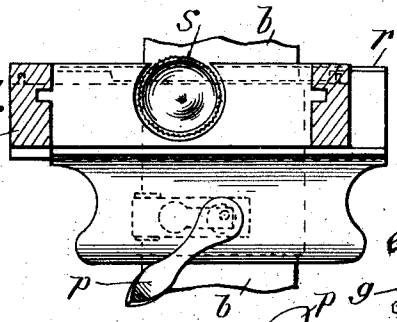


Fig. 3.

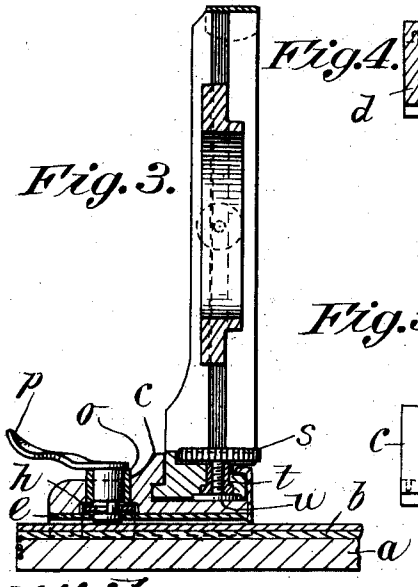


Fig. 5.

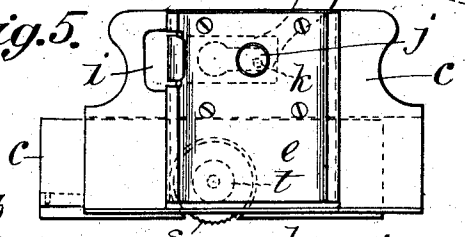
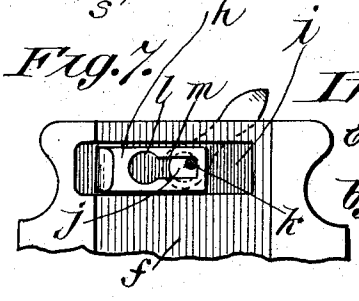


Fig. 7.



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UNITED STATES PATENT OFFICE.

EDGAR R. BULLARD, OF SPRINGFIELD, MASSACHUSETTS.

LOCKING DEVICE FOR LENS-CARRIAGES OF CAMERAS.

SPECIFICATION forming part of Letters Patent No. 668,090, dated February 12, 1901.

Application filed June 18, 1900. Serial No. 20,702. (No model.)

To all whom it may concern:

Be it known that I, EDGAR R. BULLARD, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Locking Devices for Lens-Carriages of Cameras, of which the following is a specification.

This invention relates to cameras, and refers especially to the construction of the lens-carriage and locking devices therefor, whereby the carriage may be locked on its slide at any desired distance from the lens and locked at any desired point in its transversely-sliding movement, the object of the invention being to produce simple and convenient devices for locking the carriage to the bed of the camera and for locking the transversely-sliding member of the carriage to that part thereof which engages the bed, so constructed and arranged as to be easily operated and yet so as not to interfere with the movements of other parts of the carriage, all as hereinafter set forth.

In the drawings forming part of this specification, Figure 1 is a front elevation, partly in section, of the lens-carriage and a part of the bed of the camera. Fig. 2 is a rear elevation of the same. Fig. 3 is a sectional side elevation on line 3 3, Fig. 1. Fig. 4 is a sectional plan view on line 4 4, Fig. 1. Fig. 5 is a bottom plan view of the carriage removed from the bed. Fig. 6 is a perspective view of the devices which lock the carriage to the bed, showing them separated from the metal shoe attached to the carriage. Fig. 7 is a plan view of the under side of the carriage with said sleeve removed.

In carrying out my invention I construct a slideway for the carriage on the bed *a* by securing to the latter the plate *b*, the opposite sides of which are undercut, as shown in Figs. 1 and 2. The carriage is made up, essentially, of two parts, one, *c*, of which is the base and slides on said plate *b*, as will presently be described, and the other part *d* of the carriage is mounted to slide on the latter transversely to the line of movement of the part *c*.

To properly secure the carriage to the plate *b* in such manner that only a sliding movement along said plate will be possible, a shoe *e* is secured to the under side of the base *c* of the carriage in a transverse slot *f*, (see Fig. 7,) whereby the lower edges of the turned-in sides *g* of the shoe will lie substantially in the plane of the bottom of said base part *c* of the carriage. Said turned-in sides *g* form guide-slots which engage the said undercut edges of the plate *b*, as shown particularly in Figs. 1 and 6.

The shoe *e* is secured to the base *c* by screws, preferably as shown in Fig. 5, and between said shoe and said base part is located the locking-plate *h*, to accommodate which a depression *i* (see Figs. 1 and 7) is made in the base *c* in the bottom of and transversely to the slot *f*. This lock-plate *h* is adapted to have a sliding movement transversely of the slot *f* and consequently transversely of the plate *b* on the bed *a*, and one end of said plate is turned in upon itself to form a hook for engagement with the edge of the plate *b*, and the opposite end of the lock-plate is engaged by the eccentric stud *j*, which projects down through the base part *c* of the carriage and through the lock-plate *h* into a hole in the shoe *e*. The eccentric connection with the stud *j* is effected by cutting away said stud (shown in Figs. 3 and 7) at that point at which the engagement with the lock-plate takes place in such manner as to leave a short post *k* at one side of the center of said stud, which unites the two parts thereof. The lock-plate is provided with a hole *l* and a slot *m*, narrower than the diameter of the holes leading therefrom toward the end of the lock-plate with which the stud *j* engages, and the said post *k* lies, when the parts are in operative position, in the end of this slot, as shown. The lower end of the stud engages a hole *n* in the shoe, (shown in Fig. 6,) whereby it is steadied. The upper portion of the stud is supported in a bushing *o*, let into the base part *c* of the carriage, the upper end of the stud being provided with a short lever *p*, by which it may be rotated to impart to the lock-plate its sliding movement referred to, whereby the hooked end thereof may be forcibly moved against the edge of the plate *b* to lock the carriage firmly thereto. The said stud is applied to the lock-plate by passing the end of it which enters the hole *n* in the shoe down through the hole *l* in the lock-plate until the cut-away part of the stud

lies opposite the slot *m*, and then by sliding the plate along until the post *k* lies at the end of the slot the stud is firmly held in its place in the base *c* of the carriage. The shoe is then screwed to the bottom of the carriage, thus holding the lock-plate in position, the hooked end of the said plate practically forming a part of the inturned edge of the shoe, which is cut away to receive it, as shown in Fig. 6. By rotating the stud *j* the hooked end of the lock-plate is drawn against the edge of the plate *b*, thus drawing the turned-down edge of the shoe against the opposite edge of the plate *b*, securely locking the carriage to the latter. An important feature of this lock is that by means thereof the lens will always be locked in a position of parallelism with the plate, for the locking device always draws the carriage forcibly against the same side of the plate *b* on the bed, and the bearing of the shoe *e* on said plate is so extensive that there is no chance for variation.

The part *d* of the carriage, which has a transverse sliding movement on the part *c* thereof, consists of the usual rectangular frame within which the lens-frame *q* is vertically adjustable.

A T-slot is made in the part *c* and the lower edge of the part *d* is adapted to fit it. Said T-slot is formed by cutting into the part *d* to make one of the undercut ways forming the head of the T and by forming the other undercut way by securing the plate *r* to the front of the base part *c* of the carriage, as shown in Figs. 2 and 3 particularly, which plate has its upper edge turned over at right angles to its body, as shown in said Fig. 3. The lock for this part *d* of the carriage consists of a vertical screw *s*, working in a nut *t*, let into the bottom part of the part *d* of the carriage and suitably secured therein. This screw is provided with a flat circular head, and the point of the screw bears against the bottom of the T-slot and forces the part *d* of the carriage upward against the upper edge of the two undercut ways which constitute the head of the T-slot.

One of the objects of making a part of the T-slot out of the metal plate *r* is to give to the structure the strength necessary to withstand the strain put upon it when the screw *s* is turned down through the nut *t* to lock the part *d* to the base part *c* of the carriage. A disk *u*, of metal, is interposed between the end of the screw *s* and the bottom of the T-slot to prevent the marring of the part *c* of the carriage, against which the screw would otherwise bear. The head of the screw *s* is made as thin as possible to permit of its being sunk into a cavity in the bottom of the part *d* of the carriage to a point substantially flush with the surface of that portion of the part *d* of the carriage in which the screw is located. This is essential, as otherwise the lens-frame *q* could not be moved down to its lowest position in the said part *d*.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In combination, the bed of a camera, a lens-carriage thereon comprising one base part adapted to slide on said bed, and another part adapted to slide transversely on said base part, a plate on said bed with which said base part has a sliding engagement, a locking-plate on said base part and means for moving it transversely to the movement of the latter, whereby the base part may be locked to the plate on the bed; a second locking device for said second part of the carriage for locking it to said base part, and consisting of a screw passing through the bottom portion of said second part of the carriage and adapted to bear against the base part, substantially as described.

2. The combination with the bed of a camera and a lens-carriage adapted to slide thereon, of a plate on said bed having an undercut edge, said carriage being adapted to have a sliding engagement with said plate, a lock-plate on said carriage, a rotatable stud supported on the carriage and having an eccentric engagement with said lock-plate, whereby by the rotation of said stud said lock-plate may be forced against said plate on the bed to lock the carriage thereto, substantially as described.

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