

No. 616,999.

Patented Jan. 3, 1899.

N. WIGHT.

PHOTOGRAPHIC DEVELOPING APPARATUS.

(Application filed May 26, 1898.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

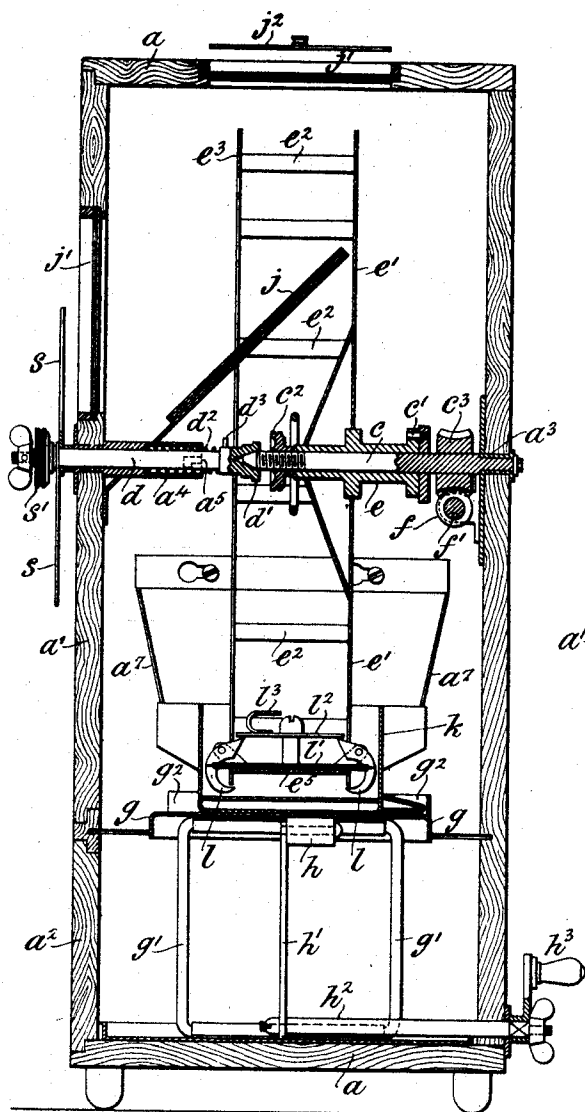
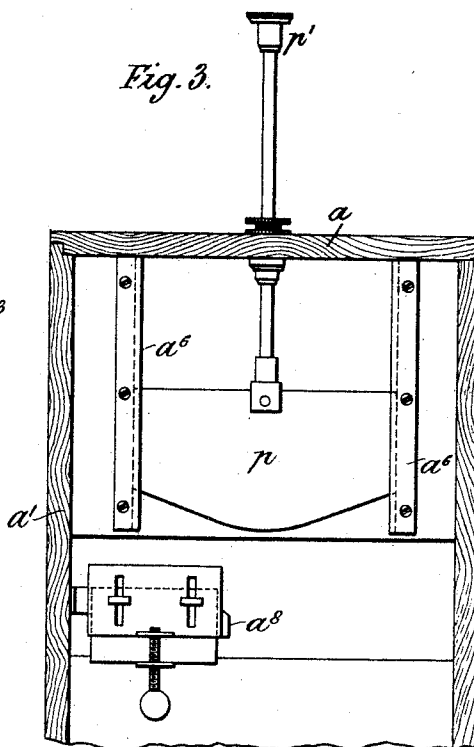


Fig. 3.



Witnesses.

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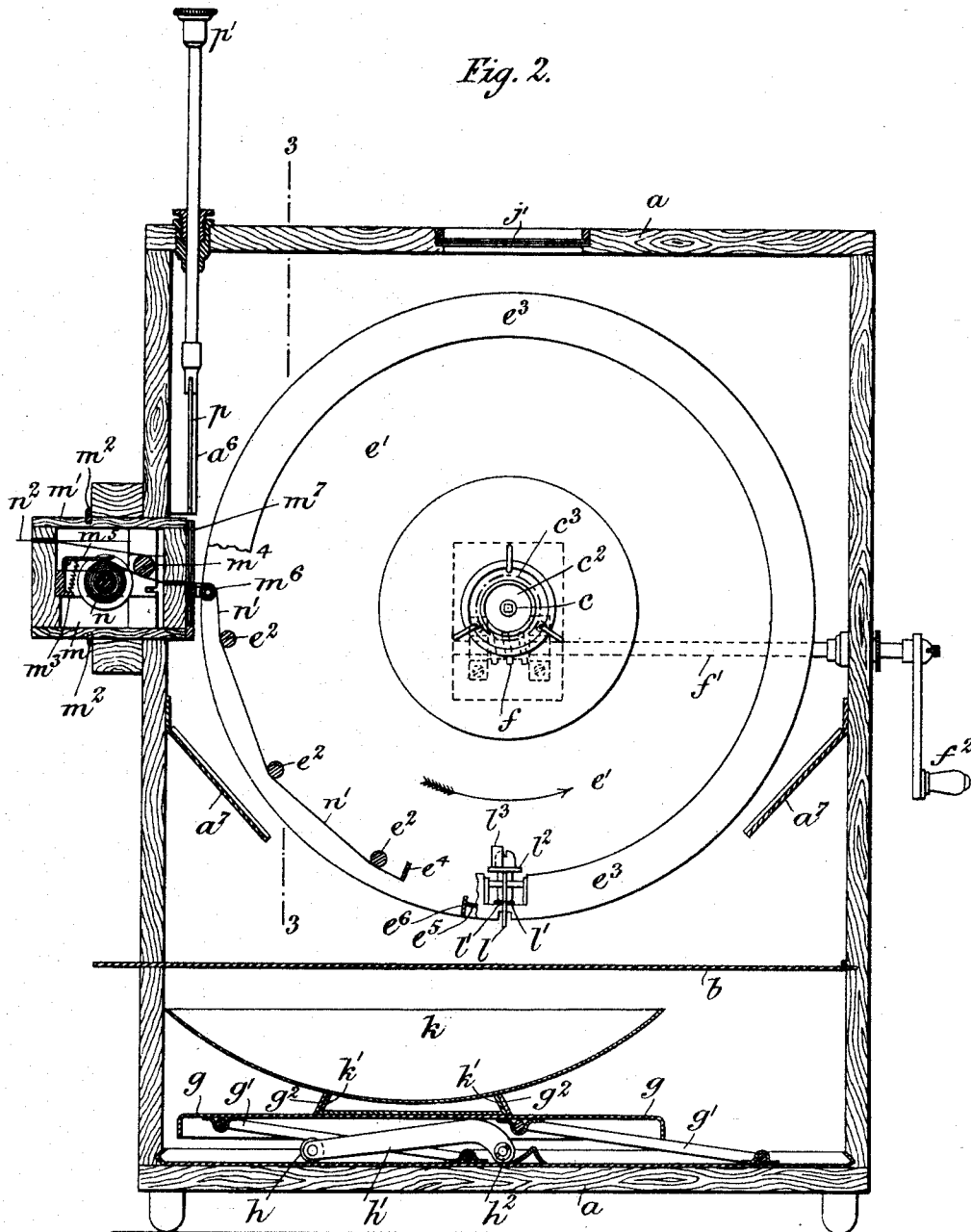
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3 Sheets—Sheet 2.



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3 Sheets—Sheet 3.

Fig. 4.

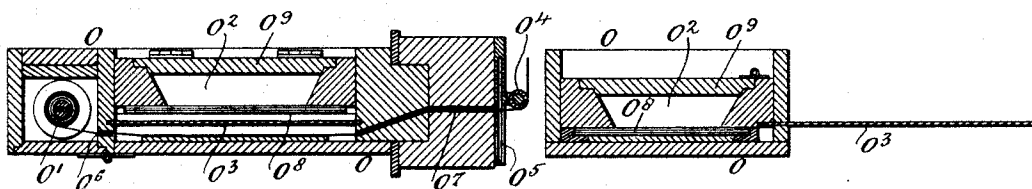
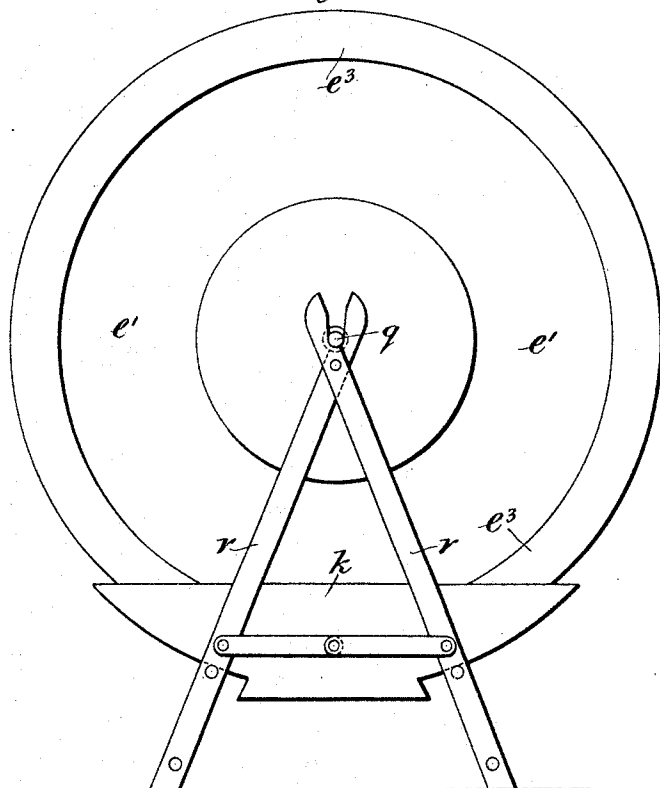


Fig. 5.



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PHOTOGRAPHIC-DEVELOPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 616,999, dated January 3, 1899.

Application filed May 26, 1898. Serial No. 681,802. (No model.)

To all whom it may concern:

Be it known that I, NORMAN WIGHT, gentleman, a subject of the Queen of Great Britain, residing at 5 S. John's avenue, Boscombe, Bournemouth, in the county of Southampton, England, have invented certain new and useful Apparatus for Manipulating Photographs, of which the following is a specification.

The principal object of this invention is to provide improved apparatus for treating photographic films without handling them or exposing them to the light and without the necessity of using a dark room; but it is also useful for avoiding handling in a dark room.

By "films" I intend to indicate all surfaces on which photographic positive and negative images are produced.

The apparatus consists of a box divided into two compartments by a movable partition, each compartment being provided with a door. The upper compartment contains a drum or reel and the lower compartment has a false bottom free to rise and fall, being mounted as a parallel ruler or in other like way. The mechanism for removing the partition turning the reel and raising and lowering the false bottom is so arranged that it can be operated from the outside without admitting light.

In using the apparatus for treating a flexible film the doors are opened and the end of the film to be treated is drawn into the upper compartment through a slit and fixed to the reel. The upper door is shut and the reel turned, drawing in the film through the slit. When the desired length has been wound on the reel, it is automatically secured and separated from the remainder by a knife working inside the box and operated from the outside. A tray containing the proper solution or liquid is placed on the false bottom, the lower door is shut, and the partition removed. The false bottom is then raised until the solution in the tray comes up to film on the reel. The reel is then turned so as to bring all the film in turn into contact with the solution for a sufficient time. When it is desired to change the solution, the false bottom is lowered, the partition is replaced, and the tray removed through the lower door.

Figures 1 and 2 are vertical central sections at right angles to each other. Fig. 3 is a sec-

tion on the line 3 3, Fig. 2, the case *m* and reel being omitted. Fig. 4 are central sections at right angles to each other of the printing-case *o*. Fig. 5 shows a stand for the reel.

a is a box provided with two doors *a'* *a''* and divided into two by a sliding partition *b*.

c is a shaft having one end working in a bearing *a''* in the side of the case and the other end in a bearing *d'* at the end of a spindle *d*, working in a sleeve *a'*, projecting inward from the door *a'*. The spindle *d* is normally pressed inward by the spring *d''*, keeping the bearing *d'* in contact with the shaft *c*; but it can be pulled a short distance outward to disengage it and held in that position by causing the pin *d''* to enter the bayonet-joint slot *a''* in the sleeve *a'*.

e is a sleeve fitting on the shaft *c* and revolving with it by reason of a pin *e'*, carried by the shaft, entering a notch in a flange on the sleeve.

c'' is a nut screwing on the shaft and holding the sleeve in place.

The sleeve *e* has fixed to it a disk *e'*, carrying bars *e''*, whose other ends are connected by an annular plate *c''*, the whole forming a reel. By unscrewing the nut *c''* the reel can readily be removed, and the width of the box is such that wider reels than that shown can be employed to receive wider films.

c'' is a worm-wheel fixed to the shaft *c* and gearing with a worm *f* on a shaft *f'*, turned by a handle *f''* outside the box.

g is a false bottom mounted on parallel links *g'* and raised and lowered by a roller *h*, bearing on its under side. The roller *h* is carried by an arm *h'*, fixed to a shaft *h''*, turned by a handle *h''* outside the box. When raised, the arm *h* is turned slightly beyond the vertical and rests on a stop, so remaining in that position until the handle *h''* is turned back again.

In Fig. 1 the false bottom *g* is shown raised and in Fig. 2 lowered.

j is a mirror fixed to the door *a'* and going inside the reel.

j' *j''* are sight-holes glazed with non-actinic glass, through which the film can be inspected either directly or by reflection. The holes *j'* can be closed by shutters *j''*.

k is a bath having a dovetailed foot *k'* fitting in guides *g''* on the false bottom *g*.

e^1 is a bar having its ends fixed to the disk e' and annular plate e^3 . If it is intended to treat short lengths of films, several such bars are provided in suitable places or the bar may be movable.

l are a pair of jaws pivoted to and normally pressed down onto the plate e^5 (fixed to e' and e^3) by the spring l' .

l^2 is a lever pivoted to the plate e^5 , which when the parts are in the position shown comes above the tail ends of the jaws l and holds the jaws off the plate e^5 .

m is a case, and m' its lid. This case fits into a hole in the box a , being prevented from entering too far by the ridges m^2 . The case m receives a frame m^3 , carrying a roller m^4 and bearings for a spool n , on which is wound the film n' and black paper n^2 , technically known as a "cartridge."

m^5 is a spring-arm bearing on the cartridge and preventing it from accidentally unwinding.

m^6 is a roller at the front of the case m .

The case m might be dispensed with, pivots for the cartridge being provided inside the box a ; but this arrangement is not so convenient. o , Fig. 4, is a somewhat similar case fitting the same hole in the box a and containing a spool o' of sensitive paper or film, a printing-frame o^2 , and a slide o^3 . At its front end is a roller o^4 .

p is a knife working in guides a^6 in the box a (these are omitted in Fig. 1) and m^7 o^5 in the cases m and o . It is operated by a handle p' from the outside of the box a .

a^7 are flaps or guards to receive drips and return them into the bath.

All the openings into the box a and cases m and o are rendered light-tight in well-known ways.

When employing the apparatus for developing a cartridge-film which has been exposed in a camera in the ordinary way, the procedure is as follows: The cartridge n , containing the exposed film, is taken from the camera and placed in the case m . A short length of the film n' and of the black paper n^2 is unwound, the one being led under the roller m^4 and forward, the other around the roller and backward. The lid m' is then put on and the case inserted into the hole in the box a , the parts being in the positions shown in Fig. 2. The door a' is opened and the reel is turned by the handle f^2 to bring the bar e^4 close to the end of the film n' which projects into the box. The film is then clipped or attached in any convenient way to the bar e^4 and the door a' is shut. The reel is then turned in the direction of the arrow, Fig. 2, winding the film onto it, the corresponding length of black paper being simultaneously drawn out of the rear of the case m . After a time the flange e^6 of the plate e^5 comes against the roller m^4 and prevents the further movement of the reel, and simultaneously the projection l^3 on the lever l^2 comes against the stop a^8 , Fig. 3, on the door a' , and the le-

ver is turned, freeing the jaws l , which are then caused by their spring to hold the film against the plate e^5 . The knife p is then forced down, cutting off the length of film which remains fastened on the reel. The knife is raised and the case m slightly withdrawn, so as to allow the reel to turn, but not sufficiently to admit light. A bath k , containing a suitable developing solution, is next put into place on the false bottom g , the door a^2 is closed, the partition b withdrawn, and the false bottom g raised. The reel is then turned by the handle f^2 until the whole of the film has been sufficiently treated. The bottom g is then lowered, the partition b put in, the door a^2 opened, and the developing solution replaced by a fixing or other solution or water. The same operations are repeated, and so on until the treatment of the film is complete. The door a' is then opened, the nut c^2 unscrewed, and the reel with the film on it removed. A spindle q is passed through the sleeve e , and the reel mounted on the stand r , Fig. 5, is put under a stream of water, which causes it to revolve and thoroughly washes the film.

In using the apparatus for printing the procedure is very similar. The end of the sensitive paper is led from the bobbin o' , Fig. 4, through the slots o^6 o^7 into the box a , which is laid onto its back, its end being attached to the reel, as above described. The frame o^2 , containing the negative o^3 , is put into place. The slide o^3 is withdrawn and the frame pressed home to bring the surface of the negative into contact with the film, and the shutter o^9 of the frame is opened. After a sufficient exposure the shutter o^9 is closed, the frame o^2 is pulled out sufficiently to allow the paper to be drawn through, but not sufficiently to allow light to enter, the reel is turned a short distance, and the frame pressed home again. A second exposure is then taken, and so on until the reel is stopped by e^6 . The knife p is then forced down, cutting off the paper, the length on the reel being treated in a similar manner to that above described. On putting in the slide o^3 the frame o^2 may be removed and the negative changed before the whole length of film has been drawn in.

Pointers s may be provided, capable of being clamped by a nut s' to the spindle d , so that they turn with the reel. These pointers can be set to indicate the position of any parts of the film requiring special treatment and also to indicate the amount to be wound on after each exposure in the printing-frame.

If a dark room be employed, the reel is placed on the stand r , Fig. 5, and the film or paper, as the case may be, attached to it, the necessary baths being placed in succession under the stand. In this way the photograph may be manipulated without any handling.

I claim—

1. The combination of a box, a slide dividing the box into two compartments, a door to

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partment, means operated from outside the box for revolving the reel, a bath in the lower compartment, means operated from outside the box for raising the bath, a clip carried by the reel, means for causing the clip to seize the film, a knife in the box, means for operating the knife from outside the box, a slotted case fitting an aperture in the upper compartment, a bobbin pivoted in the case, and a printing-frame fitting an opening in the side of the case.

13. The combination of a box, a slide dividing the box into two compartments, a door to each compartment, a reel in the upper compartment, means operated from outside the box for revolving the reel, a bath in the lower compartment, means operated from outside the box for raising the bath, a pair of clips pivoted to the reel, a spring tending to press the clips onto the reel, a lever pivoted to the reel and holding the clips out of contact with

it, a stop in the box in the path of the lever, a knife in the box, means for operating the knife from outside the box, a slotted case fitting an aperture in the upper compartment, a bobbin pivoted in the case, and a printing-frame fitting an opening in the side of the case.

14. The combination of a box, a slide dividing the box into two compartments, a door to each compartment, a reel open at one side in the upper compartment, means operated from outside the box for revolving the reel, a mirror inside the reel and fixed in the box, windows in two adjacent sides of the box, a bath in the lower compartment, and means operated from outside the box for raising the bath.

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Witnesses:

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