

N<sup>o</sup> 23,733



A.D. 1902

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COMPLETE SPECIFICATION.

“Improvements in Photographic Cameras.”

I, CONRAD BECK, of 68 Cornhill, in the City of London, Optician, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

- 5 This invention relates to photographic cameras and particularly of the instantaneous type and consists of improvements in the shutter for making the exposure, a new focussing scale for the more rapid and accurate placing of the lens, new methods of holding film spools and certain combinations and improvements of the parts to facilitate the construction and use of such shutters or cameras.
- 10 I will describe my invention by the aid of the accompanying drawings in which

Figure 1 is a perspective view of a camera embodying this invention.

Figure 2 is a top view of the focussing scale.

- Figure 3 is a longitudinal section of the winding roller of the roller blind shutter.

- Figure 4 is an elevation of one end of the winding roller of the roller blind shutter.

Figure 5 is a longitudinal section of the spool holding device, and

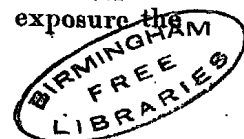
- Figure 6 is a diagrammatic view of the roller blind showing the two exposing apertures of different sizes.

In all the figures like parts are indicated by similar reference numerals.

- The sensitized photographic material is stretched in the form of a flexible band between the two rollers 1, 1 so that it is held flat across the aperture 2 in the camera frame facing the lens which is carried upon the front board 3. The front board 3 is connected with the margins of the aperture 2 by means of the ordinary flexible bellows which for clearness are not shown in the drawing. The lens also is not shown but it is attached to the lens board 3 by a screwed flange or any other suitable means. The lens board 3 is attached to a frame 4 which slides on metal runners 5. It may be slid backwards or forwards in order to focus objects at different distances and may be slid back so as to be enclosed within the casing of the camera. In this case the spring bracket links 6, 6 being released the hinged tailboard 7 may be folded up and the whole camera closed. Before doing this the frame 8, which is provided with stops 80, to limit its motion in either direction and which forms a support for the camera when lowered, should be folded up so that it lies along the edge of the tailboard 7. At the lower end of the frame 8 a slot 9 is provided which catches upon the projection 10 of the tailboard 7 and the frame 8 forms a metal binding to the edge of the tailboard when not in use.

- The shutter is of the roller blind type, a spring roller 11 being placed at say, the lower part of the camera parallel with the spool rollers (1) and a winding roller 12 being placed at the opposite part of the camera. A blind with two apertures of different sizes either of which may be brought into use as desired is attached to these rollers and as the aperture in said blind is passed across the aperture 2 in the camera frame the film is exposed. To make an exposure the

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winding roller 12 is first wound up so as to draw that portion of the blind which has one of the apertures across the aperture 2 and roll such portion of the blind upon the roller 12 the spring ratchet wheel 13 and the pawl 14 retaining the winding roller from revolving against the tension of the spring roller 11. This process of winding the aperture in the blind across the aperture 2 in the camera frame would expose the film to the light from the lens so I provide on the lens board a supplementary shutter consisting of two plates 15, 15 which close the lens while the shutter is being wound. In order to expose the film and take a photograph the knob 16 attached to the link 17 is moved downwards the first result of this is to depress the link 17 which in its turn raises the front end of the lever 18 to which it is attached. Running in a slot in the lever 18 is a pin 19 connected to a sliding plate 20 which when raised by the lever 18 opens the plates 15, 15, by means of a lever 21. Thus the lens is opened by means of the movement of the knob 16. Upon further depressing the knob 16 the pawl 14 is raised to liberate the ratchet wheel 13 and the blind is unwound from the roller 12 onto the roller 11 by the tension of the spring within the latter—during this process the aperture in the blind passes over the aperture 2 and uncovers the sensitized film for the required duration to take the photograph. It will be noticed that the front board 3 may be placed in different positions along the tail-board 7 for the purpose of focussing without interfering with the automatic action of the supplementary shutter.

It will also be observed that the link levers and slide which form the connection between the two shutters are so designed that the tailboard 7 of the camera can be folded up without interfering with their action. They are also so designed that although the front board 3 when slid back into position for closing is through the pin 19 passing out of the slot in the link 18 not attached to the links, when it is slid out onto the tail board for use the pin 19 passes into the slot in the link 18 and the action of drawing the front forward automatically makes the connection so that when the front board 3 is in position for use the two shutters are always in connection. I do not limit myself to this means of connection I can connect the winding ratchet wheel so that it closes the aperture of the front shutter during the process of winding which is at other times open. This is done by reversing the action of the plates 15, 15, and connecting the lever 17 to the winding mechanism instead of to the shutter set off. I do not limit myself to the exact arrangement of the parts 17, 18, 20, 21, I may attach the centre of the lever 21 to one end of a tightly coiled spiral spring or flexible shaft the other end of which is attached to a lever fixed near the set off pin 16—so that moving the pin 16 rotates this lever, such rotation being transferred by means of the spiral spring after the manner of the flexible shaft of a dentist's drill apparatus to the lever 21 which actuates the plates 15, 15. In this case the front shutter is permanently connected with the back shutter by the spiral spring or flexible shaft which on account of its flexibility does not interfere with the extension of the front. A series of jointed links may also be used in place of the spiral spring or flexible shaft connection. In the casing of the roller blind shutter or camera I provide an aperture 22 which is closed by a non-actinic material such as red glass or gelatine through which no light that will injure the sensitized film will pass but which will allow lettering printed upon the blind to be read such lettering indicating the position of the exposing apertures in the blind.

For making time exposures the word "Time" appears in this window 22 indicating that an aperture in the blind is opposite the aperture 2 and the sensitized film is exposed. When the word "Instantaneous" appears in this window the shutter is fully wound to make an instantaneous exposure; when the words "Double Instantaneous" appear the shutter is fully wound to make the most rapid exposures with a small aperture or slit in the blind.

To make a time exposure I introduce a sliding plate 81 which fixes the pawl 14 so that, although the lever 17 can by means of the set off 16 be depressed

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sufficiently to open the front shutter plates 15, 15, and make the exposure, the blind is not discharged by the lifting of the pawl 14.

To save room I arrange the blind rollers and the film rollers in such a manner that the stretched portions of the blind and the film are close together leaving a space between the two sets of rollers into which the lens and front board may be placed when the camera is closed.

The shutter blind has two apertures 23, 24 in it of different sizes—the one 24 is as large as the aperture (2) Figure 1 in the camera so that the whole film may be exposed at once while the other 23 is only a narrow slit which as it passes over the plate gives a very short exposure to each portion of the film in succession, between these apertures is a blank portion of the blind larger than the aperture 2 Figure 1 and either of the two halves of the blind may be used separately. Thus the half which includes the aperture 24 together with a blank portion of blind on either side of it or the half which includes the aperture 23 together with a blank portion on either side of it. The method by which either part of the blind may be used may be understood by reference to Figures 3 and 4 which represent a longitudinal section and end elevation of the winding roller 11. The winding roller 11 has fixed to it at one end a winding knob 25 which is fitted in bearings in the wood casing of the camera and revolves with it—at the other end the roller 11 revolves freely on the sleeve 26 which is fixed to the wood casing. The winding roller is provided with a block 27 firmly fixed inside it at about the centre. The block 27 is pierced with a square hole in which loosely fits a square spindle 28 the middle of this spindle is screw threaded and fits inside a screw thread in the inner end of the sleeve 26, the outer end of the spindle 28 is provided with a projection.

Figures 3 and 4 show the shutter wound for the use of that portion of the blind with the large aperture 24 which gives the so called instantaneous exposures. When the shutter is released and the blind uncoils from the winding roller the revolution of the roller 11 acting upon the spindle 28 by means of the block 27 causes it to rotate and in rotating to withdraw into the interior of the winding roller due to its screw connection with the fixed sleeve 26. When the winding roller is wound for a fresh exposure by means of the knob 25 the screw spindle 28 is driven outwards towards the exterior of the camera until the stop 29 comes into contact with the stop plate 30 which prevents its further travel and therefore limits the revolution of the winding roller 11. In this way the one half of the blind can be used without interfering with the second half which is kept wound up on the spring roller. In order to make use of the second half of the blind the stop plate 30 may be temporarily slid out of position while the winding roller is wound up to a further extent which travels the spindle 28 so that its end projects beyond the end of the sleeve 26. The stop plate 30 automatically springs back into position and when the shutter is set off the projection 29 impinges upon the other side of the stop plate and prevents its further unwinning. In this way the other half of the blind can be used without interfering with the first half which remains coiled upon the winding roller.

By placing a second stop plate at a different position the blind may be stopped in a similar manner when the large aperture 24 is exactly opposite the aperture 2 Figure 1 so as to uncover the whole of the sensitized film to make a time exposure.

Figure 2 represents my new focussing scale in which on the upper side is a series of lines representing the number of feet at which objects will be sharply in focus when the lens is placed with its pointer opposite to them, this is the usual scale used on these cameras but in place of the pointer which is generally attached to the sliding lens carrier 4 Fig. 1 I attach a scale with a pointer in the centre while upon either side of such pointer I place a series of lines marked with the apertures of the lens. These lines are placed at such positions that they indicate upon the upper scale the depth of focus of the lens with its various apertures. It is well known that although a lens will theoretically only give a

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sharp image of one plane of the picture at once in practice there is a certain range or "depth" on either side of this point which is so sharp that the eye can detect no indistinctness in the photograph. The lower scale shows at a glance without calculation the amount of this so called depth upon the upper scale when the pointer on the lower scale is set to any distance on the upper scale. In the position shown if the lens be used with an aperture of  $f/11$  all objects between  $3\frac{1}{2}$  and 8 feet will be defined approximately sharply and so on.

Fig. 5 shows my new method of holding the spools of rollable sensitized film whereby the spool can be withdrawn and replaced in spite of the fact that the centres upon which it revolves are not movable laterally. 31 is the film carrying spool-centred at one end on the centre 32 fixed to the side of the case and at the other upon the revolving centre 33 which is also provided with a tongue which fits into a slot in the roller 31 by which such roller may be revolved.—The centre 32 is provided with a boss 36 at the end which is larger than its shank and which fits the hole in the roller 31. Sliding on the shank of the centre 32 is a ring or washer 34 pressed against the roller 31 by means of a spring 35. By drawing the roller 31 towards the centre 32 against the pressure of the spring 35 the other end of the roller 31 is disconnected from the centre 33 and may now be tilted because the shank of the centre 32 is smaller than the hole in the roller 31 so that it can be withdrawn from the centre 32 and removed from the centres which are themselves fixed. The method of inserting a fresh spool is by the opposite procedure.

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

1/ In a camera the combination of a focal plane roller blind shutter a supplementary flap or shutter attached to the camera front and a connection between the two shutters by means of their set off pieces or otherwise so that while at the time the focal plane shutter is being wound the lens shutter is closed but at the time that the focal plane shutter is set off the lens shutter is open substantially as herein set forth.

2/ In a folding camera the combination of a focal plane roller blind shutter a supplementary flap or shutter attached to the camera front and a connection between the two shutters by means of their set off pieces or otherwise so that while at the time the focal plane shutter is being wound the lens shutter is closed but at the time that the focal plane shutter is set off the lens shutter is open the connection between the two shutters being such that the camera can be closed without interference with the working of the connection substantially as herein set forth.

3/ In a focussing camera, the combination of a focal plane roller blind shutter a supplementary flap or shutter attached to the camera front, and a connection between the two shutters by means of their set off pieces or otherwise so that while at the time the focal plane shutter is being wound the lens shutter is closed but at the time that the focal plane shutter is set off the lens shutter is open. the connection between the two shutters being such that wherever the front is focussed within certain limits the shutters are still in working connection, substantially as herein set forth.

4/ In a folding focussing camera the combination of a focal plane roller blind shutter, a supplementary flap or shutter attached to the camera front and a connection between the two shutters by means of their set off pieces or otherwise so that while at the time the focal plane shutter is being wound the lens shutter is closed but at the time that the focal plane shutter is set off the lens shutter is open the connection between the two shutters being such that the camera can be closed without interference with the working of the connection whilst the shutters are still in working connection when the lens is in focus for near or distant objects substantially as herein set forth.

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5/ The combination of a roller blind shutter a secondary shutter on the camera front and link 17, slotted lever 18, slide 20, lever 21, pawl 14 and ratchet wheel 13 connecting them together, substantially as described.

6/ In a roller blind shutter provided with two apertures in blind, an adjustable stop to allow of one only of these apertures being used at one time, such stop depending for its action upon the travel of a screw due to the revolution of one of the blind rollers substantially as herein set forth.

7/ In a roller blind shutter provided with two apertures in blind the combination of a roller actuating a screw, and a stop to check the screw and stop the roller and a means of altering the position of the stop in relation to the screw or screw actuated mechanism substantially as herein set forth.

8/ A roller blind shutter provided with two apertures in blind having within the winding roller a block engaging with a rod which rod is attached by screw to one of the bearings of the roller which bearing has a movable stop to engage with a stop on the rod substantially as described.

9/ A roller blind shutter having marks or a lettering printed on the blind combined with a non actinic window in the camera through which such marks can be read substantially as herein set forth.

10/ A roller blind shutter placed between the lens & the sensitive film having marks or lettering on the blind combined with a non actinic window in the camera through which such marks can be read substantially as herein set forth.

11/ A roller blind focal plane shutter combined with a roll film carrier in such a manner that the centres of the rollers are approximately in one plane and the stretched portions of the film and blind are on the same sides of the rollers and adjacent to each other substantially as herein set forth.

12/ A roller blind focal plane shutter combined with a roll film camera having the blind rollers parallel to the film rollers.

13/ A double focussing scale consisting of one portion engraved with distances and another portion having an index arrow or mark and a series of divisions to denote the amount of depth of focus with various apertures of the lens substantially as described.

14/ In a roll film camera, studs to hold the bobbins or spools, which are fixed portions of the camera in combination with a device to allow of the spools sliding along the studs for their insertion or removal substantially as described.

15/ In a roll film camera the combination of a folding tailboard a surrounding binding at the edge of same jointed to the tailboard to fold down as a support and stops to limit the travel of such folding binding substantially as herein set forth.

Dated this 30th day of October 1902.

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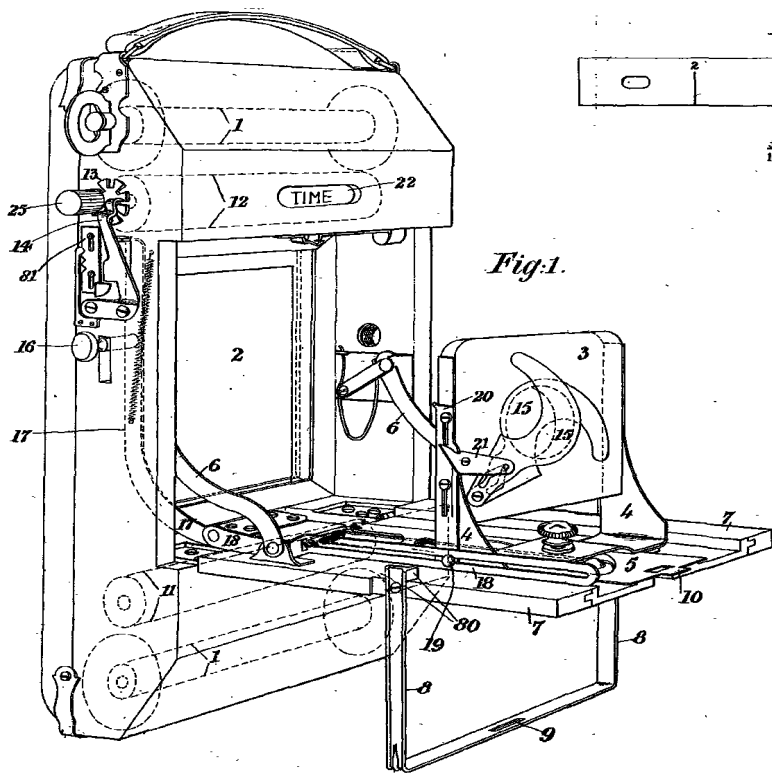


Fig. 1.

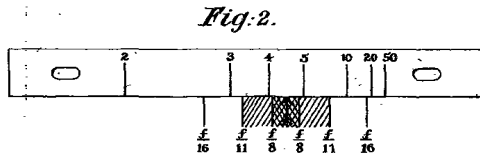
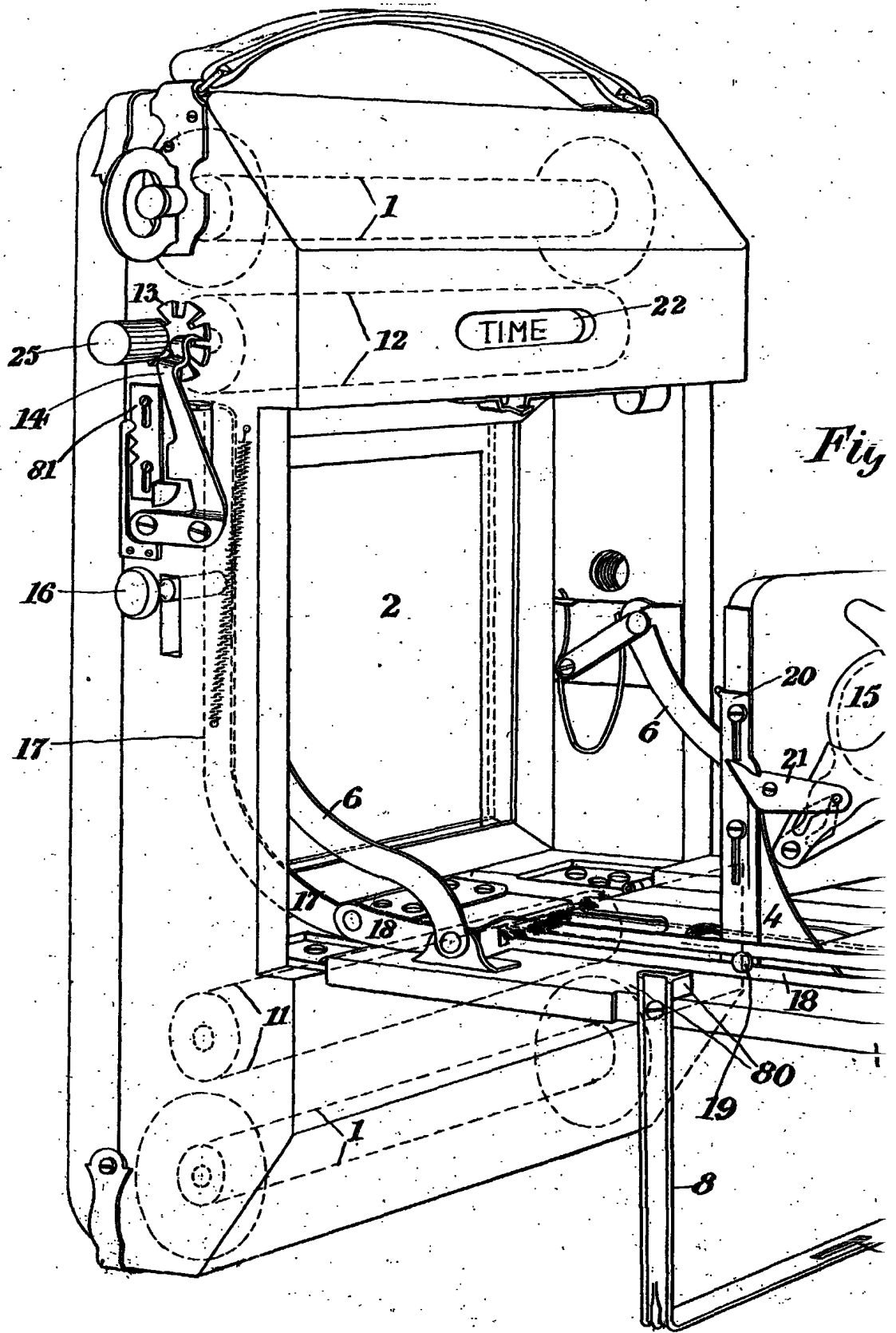


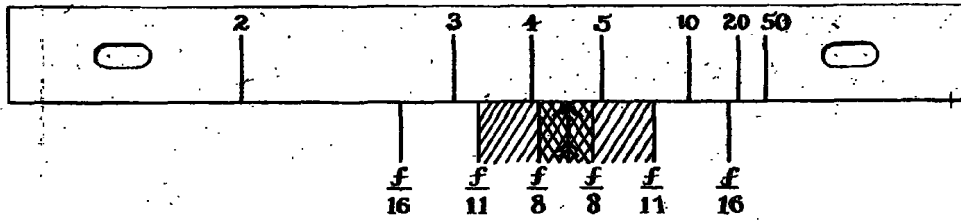
Fig. 2.

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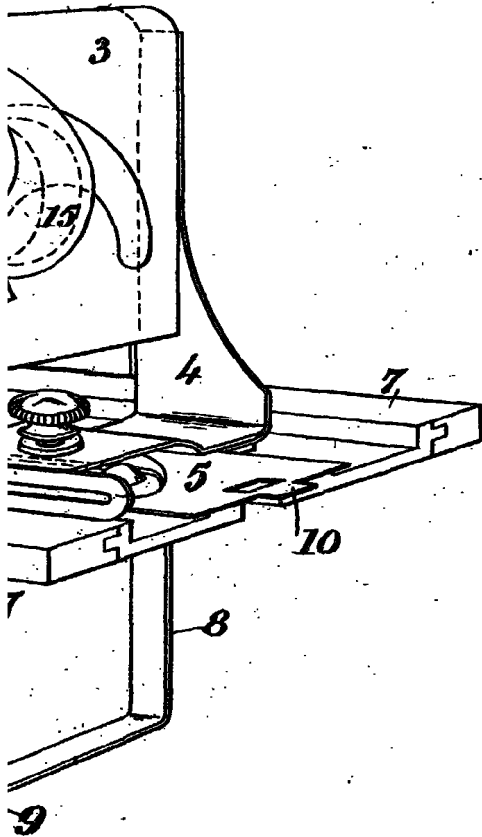
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*Fig:2.*

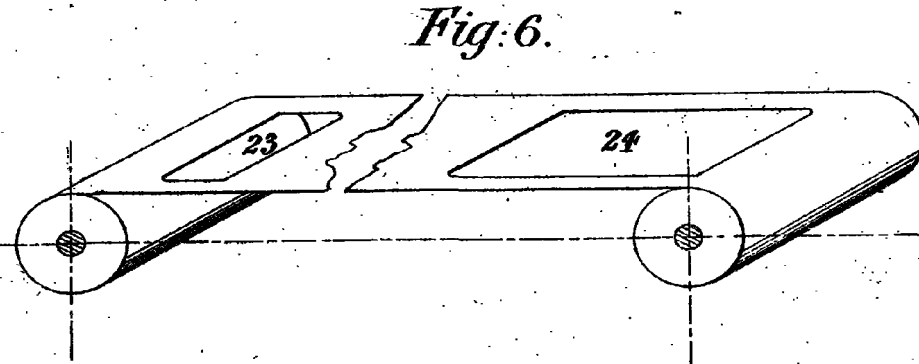
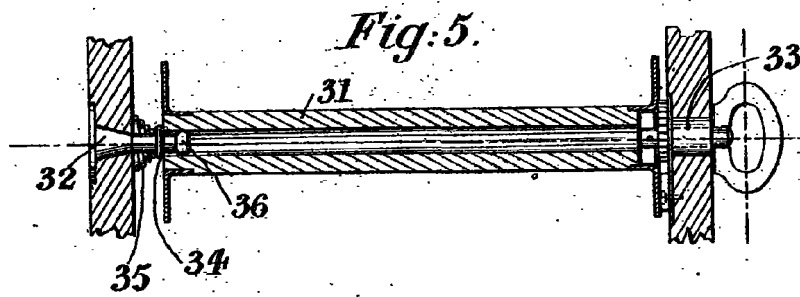
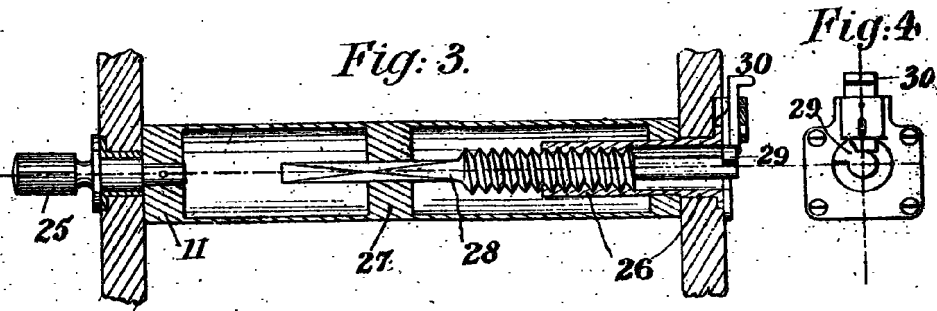


*Fig:1.*



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





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