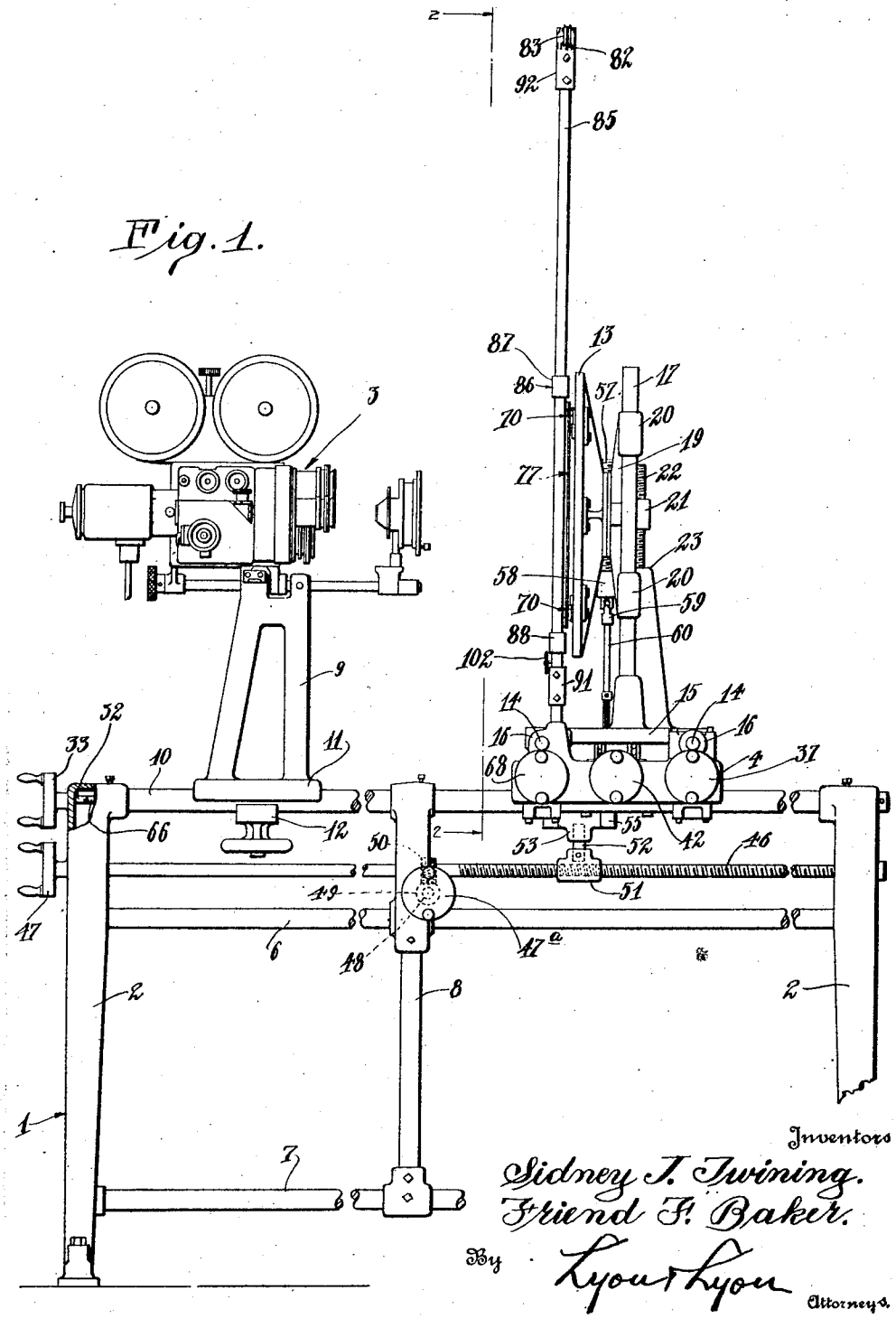
Oct. 19, 1926. 1,603,882

S. J. TWINING ET AL

PHOTOGRAPHING APPARATUS

Filed June 22, 1925 3 Sheets-Sheet 1

Fig. 1.



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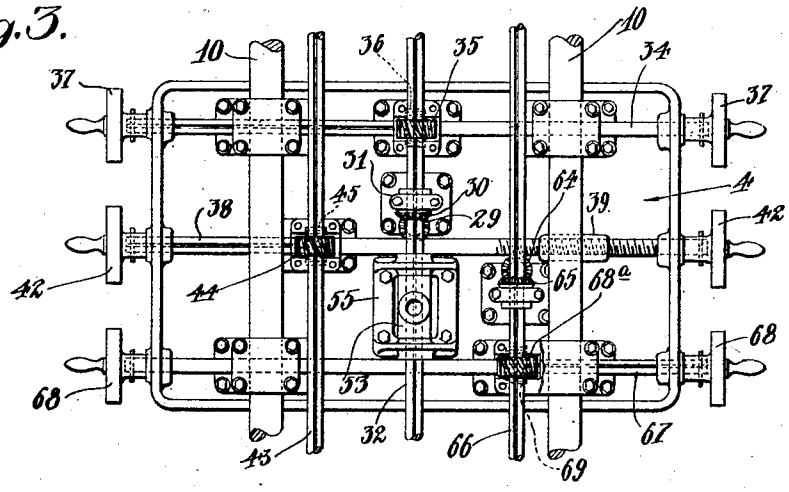
Oct. 19, 1926. 1,603,882

S. J. TWINING ET AL

PHOTOGRAPHING APPARATUS

Filed June 22, 1925 3 Sheets-Sheet 2

Fig. 3.



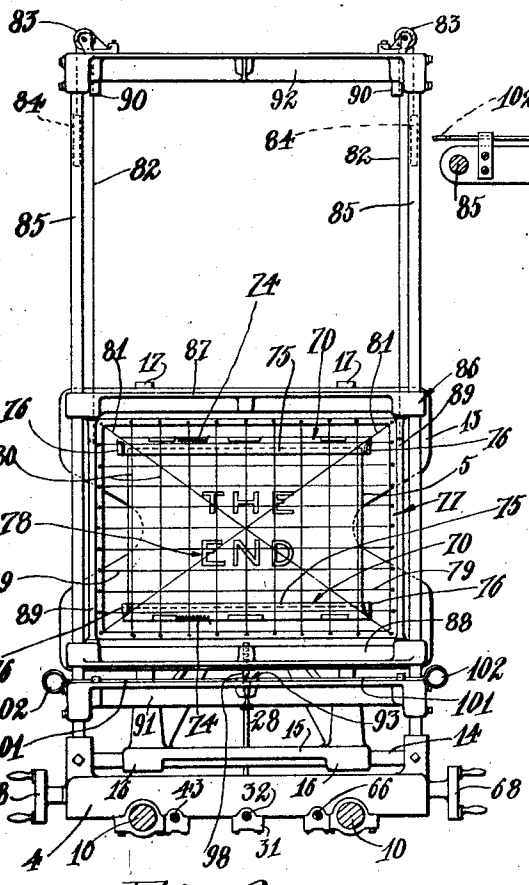


Fig. 2.

Fig. 4.

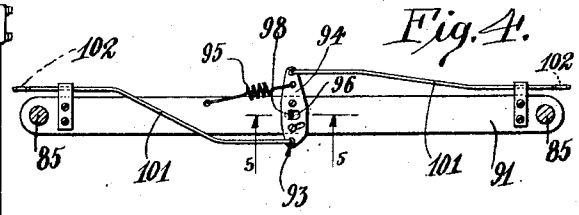
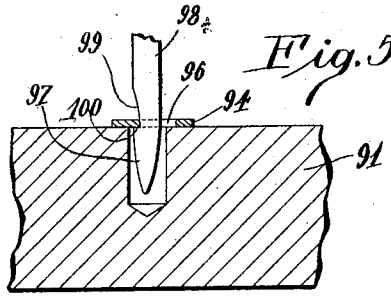


Fig. 5.



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PHOTOGRAPHING APPARATUS

Filed June 22, 1925 3 Sheets-Sheet 3

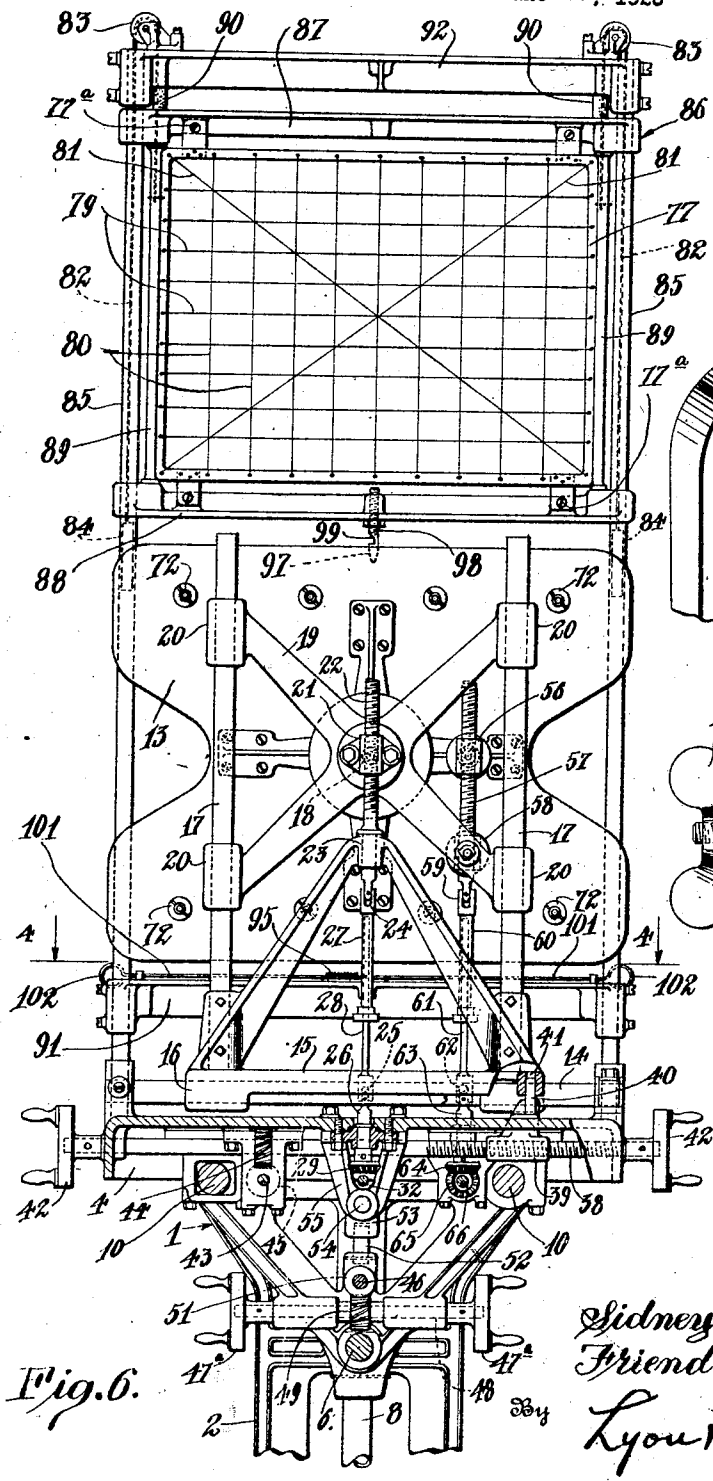


Fig. 6.

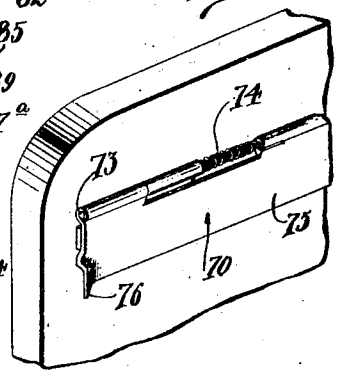


Fig. 7.

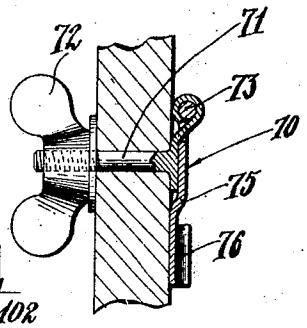


Fig. 8.

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UNITED STATES PATENT OFFICE.

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PHOTOGRAPHING APPARATUS.

Application filed June 22, 1925. Serial No. 38,745.

This invention relates to a machine for photographing titles or other printed matter which is to appear upon a film. Titles fall into two general classes; the regular or usual titles and sub-titles, and the more elaborate titles known as "art titles" which are expected to give an artistic effect when thrown upon the screen. The regular titles are usually uniform in size and appearance and large numbers may be photographed at the same distance from the camera. Art titles vary in size and appearance and are photographed at varying distances from the camera so as to produce the desired effect. More than one exposure is often made on the same film in producing an art title.

The general object of this invention is to provide simple means for insuring that when an art title is to be photographed upon the film, it may be given the desired size and accurately aligned; and also to provide the machine with means for facilitating the rapid photographing of the regular or common form of titles and sub-titles. One of the objects of the invention is to provide a simple machine for supporting a card or other device bearing the printed matter or title which is to be photographed, provided with means for effecting longitudinal and vertical adjustments of the card with respect to the camera; also to provide means for tilting the card. In the preferred embodiment of the invention it includes a frame along which the card support may be moved and one of the objects of the invention is to provide means for enabling the card to be adjusted from the side of the frame near the card and also from the end of the frame near the position of the camera.

A further object of the invention is to provide improved means embodied in the mechanism, which will facilitate its proper functioning in the adjustment of the card support longitudinally of the frame without necessitating accurate fitting of certain parts in the mechanism; more specifically this means operates to permit slight lateral movements of the card support or carriage with respect to the feed screw which effects the longitudinal movements of the carriage on the frame, in this way enabling the mechanism to operate effectively even if the feed screw and the longitudinal guides for the carriage are slightly out of alinement.

Further objects of the invention will appear hereinafter.

The invention consists in the novel parts and combination of parts to be described hereinafter, all of which contribute to produce an efficient photographing apparatus.

The preferred embodiment of the invention is described in the following specification, while the broad scope of the invention is pointed out in the appended claims:

In the drawing:

Fig. 1 is a side elevation of apparatus embodying our invention, certain parts being broken away.

Fig. 2 is a front elevation of the platen of the machine and may be regarded also as a vertical cross section through the upper portion of the frame of the machine taken about in the plane of the line 2—2 of Figure 1, the lower portion of the machine being omitted.

Fig. 3 is a bottom plan of the carriage and illustrating details of means which I may employ for effecting any movements of the carriage which may be necessary in properly positioning it for photographing the printed matter on the card.

Fig. 4 is a horizontal section taken about on the line 4—4 of Figure 6 and further illustrating details of mechanism which we employ in connection with a gaging screen which assists in properly alining the card on its support or platen, certain parts being omitted.

Fig. 5 is a section upon an enlarged scale taken about on the line 5—5 of Figure 4 and further illustrating these details.

Fig. 6 is a rear elevation of the platen with its associated mechanism and showing the carriage and portions of the frame in cross section, certain parts being broken away.

Fig. 7 is a fragmentary perspective showing a corner of the platen and particularly illustrating means which may be employed, if desired, for holding the card on the platen.

Fig. 8 is a vertical section through the platen further illustrating one of these holding devices which is illustrated in Figure 7.

The apparatus comprises a frame 1 which may include end frame members 2—2. This frame is preferably of elongated form and provided with means for supporting and guiding the camera 3, and for supporting

and guiding a carriage 4, which may support the card 5 which is to be photographed. The frame also may include two horizontal stay bars 6 and 7 which may be connected together by an intermediate frame member 8. If desired, the camera 3 may be supported on a fixed stand which is opposite to the carriage 4, but we prefer to mount the camera 3 upon a stand 9 which is guided so that it can be moved longitudinally on the frame.

In order to provide for guiding the stand 9 and the carriage 4, we provide the upper portion of the frame with two horizontal guide bars 10, and the lower portion of the camera stand 9 may be formed into a saddle 11 sliding on the upper sides of these bars 10, suitable clamping means 12 being provided for clamping the stand where desired.

Above the carriage we provide a platen 13 which is supported on the carriage, and we provide means for adjusting this platen in a vertical direction and in a horizontal direction. We also provide means for tilting the platen on a horizontal axis. A construction is provided whereby these adjustments may be made from the end of the frame 1 adjacent the camera or from each side of the carriage. In order to accomplish this, on the upper side of the carriage, we provide a pair of transverse guide bars 14 on which slides a platen-base 15, said platen-base being provided with guide sleeves 16 which slide on the bars 14.

This platen-base is preferably in the form of an A-frame, see Figure 6, and is constructed with means for enabling the platen to be guided up or down. In the present instance the platen-base is provided with two vertical posts or guide bars 17, see Figure 6, and the platen is mounted to rotate on an axis passing transverse to or through the plane of the platen; in the present instance it is supported on a horizontal pin 18 mounted in a platen carrier 19. This platen-carrier is preferably constructed in the form of a spider, having arms with guide sleeves 20 to slide on the guide-bars 17. At the center of this spider we provide a nut 21, the threads of which engage a vertical adjusting-screw 22, the lower end of which is rotatably mounted at 23 in the upper end of the platen-base 15.

We provide means carried on the frame 1 for rotating this feed-screw in any lateral position that the platen base 15 may have on its guide bars 14. For this purpose we provide a pair of universal connections 24 and 25, the former of which is attached to the lower end of the feed screw 22 below its bearing 23 and the latter of which is connected to a vertical stub-shaft 26 which passes through the carriage 4, see Figure 6. The universal joints 24 and 25 are formed at the ends of an extensible shaft including a sleeve member 27 and an inner shaft 28 which have a sliding connection with each other; and there is a spline or feather connection (not illustrated) between the shaft members 27 and 28 so as to enable rotary movement to be imparted from the lower section 28 to the upper section 27.

The stub-shaft 26 may be rotated through the agency of a bevel gear 29 carried on its lower end, meshing with a bevel gear 30 which is fixed for rotation in a bracket 31 on the under side of the carriage, see Figure 3, and which is splined to slide on a longitudinal shaft 32 which extends longitudinally of the frame. At the end of the frame adjacent the camera 3, a hand wheel 33 is attached to this shaft 32 for rotating it at will. Means are also provided for rotating this shaft 32 from each side of the carriage 4. This means is in the form of a transverse shaft 34, see Figure 3, which is rotatably mounted in the carriage and which is provided at its middle point with a spiral gear 35 which meshes with a similar spiral gear 36 splined on the shaft 32. The ends of the shaft 34 beyond the sides of the carriage 4 are provided with hand wheels 37 for rotating this shaft 34 at will.

The platen-base 15 may be adjusted transversely of the frame, that is to say it may be slid on its guide bars 14 by means of a traverse-screw 38, see Figure 6, on which runs a nut 39, and we provide a connection between this nut 39 and the under side of the platen-base 15. This connection is constructed in such a way that it will operate to impart movement from the nut to the platen-base regardless of whether the traverse-screw 38 and the guide bars 14 are accurately alined with each other. For this purpose we provide a pin 40 which projects up from the upper side of the nut and this pin slides in an opening or socket 41 in which it fits loosely, and which is formed in the under side of the platen base 15. This traverse-screw 38 is rotatably mounted in the carriage 4 and its ends beyond the sides of the carriage are provided with hand wheels 42 for rotating it at will.

We also provide means for effecting the rotation of this traverse-screw from the end of the frame near the camera. For this purpose we provide a longitudinal shaft 43 rotatably mounted in the frame and provided with a hand wheel (not illustrated) at the end of the frame near the camera. This hand-wheel is similar to the hand wheel 33 already described. Between the shaft 43 and the traverse-screw 38 we provide a connection consisting of a spiral gear 44 splined on the shaft 43 and a spiral gear 45 keyed on the shaft of the traverse screw 38.

In order to move the carriage 4 longitudinally of the frame at will, we provide a longitudinally disposed feed-screw 46 which

is rotatably mounted in the frame, and which may be rotated from the end of the frame by a rigid hand wheel 47, see Figure 1. This feed screw 46 may be rotated from the side of the frame by means of either of two hand-wheels 47ª, see Figure 6, which are attached to a cross-shaft 48 carrying a spiral gear 49 which meshes with a spiral gear 50 rigid on the shaft of the feed screw 46.

On the feed screw 46 there is mounted a nut 51, and we provide a flexible connection between this nut and the carriage 4 which enables the carriage to have a limited amount of lateral movement with respect to the feed-screw. This enables the machine to be constructed without necessitating a very accurate parallelism of the feed-screw 46 with the guide bars 10 on which the carriage slides. This flexible connection preferably comprises a pin 52 which projects up from the upper side of the nut and which has a sliding connection in a socket formed in a knuckle head 53. This knuckle head is mounted to rotate on a horizontal pin 54 which is carried in a bracket 55 secured on the under side of the carriage.

In order to effect the tilting of the platen at will on its pivotal support 18, we provide a swiveled nut 56 attached to the back of the platen, see Figure 6. Through this swivel-nut passes the tilting screw 57 which is disposed in a substantially vertical position, its lower end being supported and mounted so that it can swivel in a swivel-bearing 58 attached to one of the arms of the platen-carrier or spider 19. Below the swivel bearing 58 the end of the tilting-screw 57 has a universal connection 59 with an extensible shaft composed of a sleeve shaft 60 and an inner shaft 61. The shaft sections 60 and 61 have a feather or spline connection (not illustrated) enabling rotation to be imparted through them to the tilting-screw 57. The lower end of the shaft section 61 has a universal connection 62 with a stub-shaft 63 which is rotatably mounted in a vertical position and passes through the carriage 4. The lower end of this stub-shaft carries a bevel gear 64 which meshes with a bevel gear 65 splined on a shaft 66 which extends longitudinally of the frame, and provided at the end of the frame with a hand wheel (not illustrated) similar to the hand wheel 33.

This shaft 66 may be rotated at will from the side of the carriage through the medium of a cross-shaft 67, see Figure 3, the ends of which are provided with hand-wheels 68. This cross shaft 67 carries a spiral gear 68ª which meshes with a similar spiral gear 69 splined on the shaft 66.

If desired the card 5 may be simply pinned upon the face of the platen 13 if the platen is made of wood, but I prefer to provide holding devices 70 on the face of the platen. These holding devices may be in the form of spring hinges, see Figures 7 and 8. The device may have studs 71 which pass through the platen from the forward side and which are secured in place by wing-nuts 72. The inner ends of these studs 71 support a hinge connection 73 including a spring such as the spring 74; the spring exerts its pressure against a holding plate 75 to press the same down against the face of the platen. At their ends these holding plates 75 may be turned upwardly so as to form guide lips 76 to facilitate the introduction of the edges of the card in the holders; these lips 76 may be used as handles to lift the holding plates when desired.

The apparatus is provided with a gaging screen 77, see Figures 2 and 6, the function of which is to facilitate the proper positioning of the card 5 when it is put in place on the platen. This gaging screen may be constructed in any way which will provide a plurality of horizontal lines at different levels, and a plurality of spaced vertical intersecting guide lines or bars to be used in alining the printing or title 78. In the present instance this gaging frame is simply a rectangular frame with horizontal cross wires or lines 79 and vertical wires or lines 80. If desired, these lines 79 and 80 could be formed as lines on a transparent sheet. In addition to the lines 79 and 80 we provide the screen with two diagonal lines or wires 81, the intersection of which indicates the geometrical center of the platen, that is to say, it will indicate it when the screen is disposed in front of the platen.

The screen is supported on the carriage in such a way that when not in use it is held in a withdrawn position, but when it is desired to use it, it may be advanced into position in front of the card 5. We prefer to suspend this screen on small wire cables or cords 82 which pass around pulleys 83 so that their other ends may be attached to counter weights 84 guided in vertical stanchions 85 which extend up from the carriage 4. These stanchions 85 operate as guides for the gaging-frame 77.

In order to facilitate guiding the gaging-frame, it is secured to a sliding frame 86 composed of an upper bar 87 and a lower bar 88, said bars being connected together by vertical tie-bars 89. The counterweights 84 more than counterbalance the weight of the gage-frame so that if it is not held down it will slide up automatically to its elevated position in which it is shown in Figure 6. In sliding up in this way the upward movement of the slide 86 will be arrested by rubber bumpers 90, which will be engaged by the upper bar 87 of the sliding frame. These bumpers 90 are carried on the under side of a cross bar 92 which connects the stanchions 85, and if desired

they may be made in the form of sleeves through which the wires or cables 82 pass.

In order to latch the gage-screen 77 in its operating position we provided a latching device 93 see Figure 4, which comprises a latching plate 94 pivoted on a cross bar 91, and provided with a spring 95 constraining the plate into its latching position. This plate has an opening 96 through it, and as the screen is pulled down the edge of this opening is engaged by a cam face 97 on the end of a vertical pin 98, (threaded for adjustment) which projects down from the lower bar 88. This cam face 97 displaces the latching plate 94 until it snaps into a notch 99 in the side of the pin at which time it lies over shoulder 100. This shoulder cooperates with the latch to hold the screen down. The latching plate 94 may be released at will by means of two pull wires 101 which extend over to each side of the frame where they are provided with eyes 102 which may be operated by one's finger.

In operating the apparatus to photograph an art title, the operator places the card on the platen and secures it there; he then stands behind the camera and observes the card through the finder of the camera. He may now adjust the platen toward him or away from him by means of the proper hand wheel near the camera until the title has the desired size on the film. Then he focusses the camera in the regular way and observes the position of the title with respect to the cross wires in the finder. If the title is not properly aligned with respect to the cross wires, the operator then turns the proper hand wheels for adjusting the platen to the right or left or up or down. In addition to this, if the title appears in an inclined position with respect to the cross wires of the finder, the operator should move the proper hand wheel to tilt the platen until the title is exactly parallel with the horizontal cross wire.

Where a number of titles or sub-titles are to be photographed and which are not art titles, they would be printed on cards with the printing of a more or less uniform size. The operator takes one of the cards and secures it on the platen, and he pulls down the screen 77 and latches it in front of the card. He then leans around in front of the screen so that he can observe whether the card is properly aligned with the gage lines on the screen. He then makes any necessary adjustments in the platen to align and center the card using the gage lines of the screen as a guide. Having done this, he releases the screen and permits it to ascend, the operator then closes a switch (not shown) which closes the motor circuit of the camera, operating to photograph the necessary number of pictures upon the film. In this way a number of titles or sub-titles can be very rapidly photographed without necessitating the operator's going to the camera from his position near the platen.

If desired the frame of the screen 77 may be mounted on screws 77^a in large holes in lugs (see Fig. 6). This will enable the screen to be fixed permanently in any slightly adjusted position.

It is understood that the embodiment of the invention described herein is only one of the many embodiments this invention may take, and we do not wish to be limited in the practice of the invention, nor in the claims, to the particular embodiment set forth.

What we claim is:

1. In an apparatus for photographing titles or the like, the combination of a frame, a carriage movably mounted on the frame, a platen supported on the carriage for holding a card carrying the title, means for adjusting the platen in a vertical direction and a horizontal direction, a gauging frame independent of the platen with a plurality of horizontal gauging lines at different levels, and means for moving and guiding the frame and holding the same in position before the platen.

2. In an apparatus for photographing titles or the like, the combination of a frame, a carriage movably mounted on the frame, a platen supported on the carriage for holding a card carrying the title, means for adjusting the platen in a vertical direction and a horizontal direction, and a gauging frame guided on the carriage to move independently of the platen and movable into position in front of the platen and having substantially vertical and horizontal gauge lines for indicating the alinement of the card carrying the subtitle when fastened on the platen.

3. In an apparatus for photographing titles or the like, the combination of a frame, a carriage movably mounted on the frame, a platen supported on the carriage for holding a card carrying the title, means for adjusting the platen in a vertical direction and a horizontal direction, a gauging frame guided on the carriage and movable into position in front of the platen and having substantially vertical and horizontal gauge lines for indicating the alinement of the card carrying the sub-title when fastened on the platen, a counterweight operating to hold the screen normally in a position withdrawn from the face of the platen, and a latch device for latching the screen in position before the platen.

4. In an apparatus for photographing titles or the like, the combination of a frame, a carriage movably mounted on the frame, a platen supported on the carriage for holding a card carrying the title, a pair of tubular stanchions supported on the carriage,

pulleys, a gauging screen suspended on the pulleys and movable into position before the platen, said screen having lines for alining the card, and counterweights for the gauging screen guided within the tubular stanchions for withdrawing the gauging screen from before the platen.

5. In an apparatus for photographing titles or the like, the combination of a frame, a carriage movably mounted on the frame, a platen supported on the carriage for holding a card carrying the title, a pair of tubular stanchions supported on the carriage, pulleys, a gauging screen suspended on the pulleys and movable into position before the platen, said screen having lines for alining the card, counterweights for the gauging screen guided within the tubular stanchions for withdrawing the gauging screen from before the platen, and means for latching the screen in position before the platen.

6. In an apparatus for photographing titles or the like, the combination of an elongated frame having means for supporting a camera, a carriage movably mounted on the frame, a platen supported on the carriage for holding a card carrying a title, means extending longitudinally of the frame for effecting adjustment of the platen in a horizontal direction and in a vertical direction, a hand-operated means for the same located at the end of the frame adjacent the camera, and operating means for the same located at the side of the carriage.

7. In an apparatus for photographing titles or the like, the combination of an elongated frame having means for supporting a camera, a carriage mounted to move longitudinally on the frame, a platen-carrier guided to slide vertically on the carriage, means for supporting the platen-carrier on the carriage, said last named means being movably mounted transversely of the carriage, a platen, a pivot pin at the back of the platen for supporting the same to rotate on an axis extending through the plane of the platen, and means for adjusting the platen on its pivotal support.

8. In an apparatus for photographing titles or the like, the combination of a frame having means for supporting a camera, a carriage movably mounted on the frame, a platen base mounted to slide transversely on the carriage, a platen carrier guided for vertical movement on the platen base, a platen mounted on the carrier to move about a horizontal axis, transverse to the plane of the platen and means operatable from the side of the carriage for moving the platen base transversely on the frame, for adjusting the platen carrier vertically, and for adjusting the platen on the said horizontal axis of rotation.

9. In an apparatus for photographing titles or the like, the combination of a frame a carriage mounted to move along the frame, a platen-base mounted to move transversely on the carriage and having vertical guide bars, a platen-carrier guided on the guide bars, a platen supported on the platen-carrier for rotation on a horizontal axis transverse to the plane of the platen, a swivelled nut carried by the platen, a tilting screw passing through the nut for tilting the platen, and means for supporting and actuating the tilting screw.

10. In an apparatus for photographing titles or the like, the combination of a frame, a carriage mounted to move along the frame, a platen-base mounted to move transversely on the carriage and having vertical guide bars, a platen-carrier guided on the guide bars, a platen supported on the platen-carrier for rotation on a horizontal axis, a swivelled nut carried by the platen, a tilting screw passing through the nut for tilting the platen, an extensible shaft including universal joints for connecting the tilting screw with the carriage, and means for rotating the extensible shaft to adjust the platen on its horizontal axis of rotation.

11. In an apparatus for photographing titles or the like, the combination of a frame, a carriage mounted to move along the frame, a platen-base mounted to move transversely on the carriage and having vertical guide bars, a platen-carrier guided on the guide bars, a platen supported on the platen-carrier for rotation on a horizontal axis, a swivelled nut carried by the platen, a tilting screw passing through the nut for tilting the platen, an extensible shaft including universal connections for connecting the tilting screw with the carriage, means mounted on the side of the carriage for rotating the extensible shaft, and means mounted at the end of the frame for rotating the extensible shaft.

12. In apparatus of the kind described, an elongated frame, a carriage guided to move longitudinally on the frame, means for moving the carriage along the frame, a platen-base guided to slide transversely on the carriage, an adjusting screw carried by the platen base, a platen-carrier guided on the platen base and having a nut cooperative with the adjusting screw, a platen carried by the platen-carrier, an extensible shaft including universal joints connecting the adjusting screw with the carriage, and means on the carriage for rotating the extensible shaft.

13. In apparatus of the kind described, an elongated frame, a carriage guided to move longitudinally on the frame, means for moving the carriage along the frame, a platen-base guided to slide transversely on the carriage, an adjusting screw carried by the platen base, a platen-carrier guided on the platen base and having a nut cooperative

with the adjusting screw, a platen carried by the platen-carrier, an extensible shaft including universal joints connecting the adjusting screw with the carriage, means on the carriage for rotating the extensible shaft, a swivelled nut on the platen, a tilting screw cooperating with the last named nut and rotatably supported on the platen-carrier, a flexible shaft including universal joints connecting the tilting screw with the carriage, and means for rotating the last named extensible shaft from the side of the carriage.

14. In apparatus of the kind described, the combination of a frame, a carriage guided to move longitudinally on the frame, a traverse screw mounted in the carriage with means for rotating the same from the side of the carriage, a nut running on the screw, a platen-base guided to slide transversely on the carriage, a connection between the said nut and the said platen base to enable the nut to move the base to and fro when the traverse screw is rotated, means for rotating the traverse screw from the end of the frame, and a platen supported on the platen base.

15. In a machine of the kind described, the combination of a frame, a carriage, means for guiding the carriage longitudinally on the frame, a feed screw extending longitudinally of the frame, a nut carried on the feed screw, and a flexible connection between the nut and the carriage enabling the nut to move the carriage longitudinally of the table and permitting slight lateral movements of the carriage relative to the nut to allow for faulty alignment of the feed-screw and the guiding means.

16. In a machine of the kind described, the combination of a frame, a carriage, means for guiding the carriage to move longitudinally of the frame, a feed screw extending longitudinally of the frame, a nut mounted on the feed screw, a knuckle head pivotally supported on the carriage on an axis permitting limited movement of the knuckle head in a plane transverse to the longitudinal axis of the frame and a pin and socket connection between the nut and the knuckle head, said nut and said knuckle head cooperating to permit slight lateral movements of the carriage with respect to the nut to allow for faulty alignment of the feed-screw and the guiding means.

Signed at Universal City, Calif., this 4th day of June 1925.

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FRIEND F. BAKER.