No. 746,234. PATENTED DEC. 8, 1903.

M. W. ARMSTRONG.

PHOTOGRAPHIC PRINTING FRAME.

APPLICATION FILED MAR. 30, 1903.

NO MODEL.

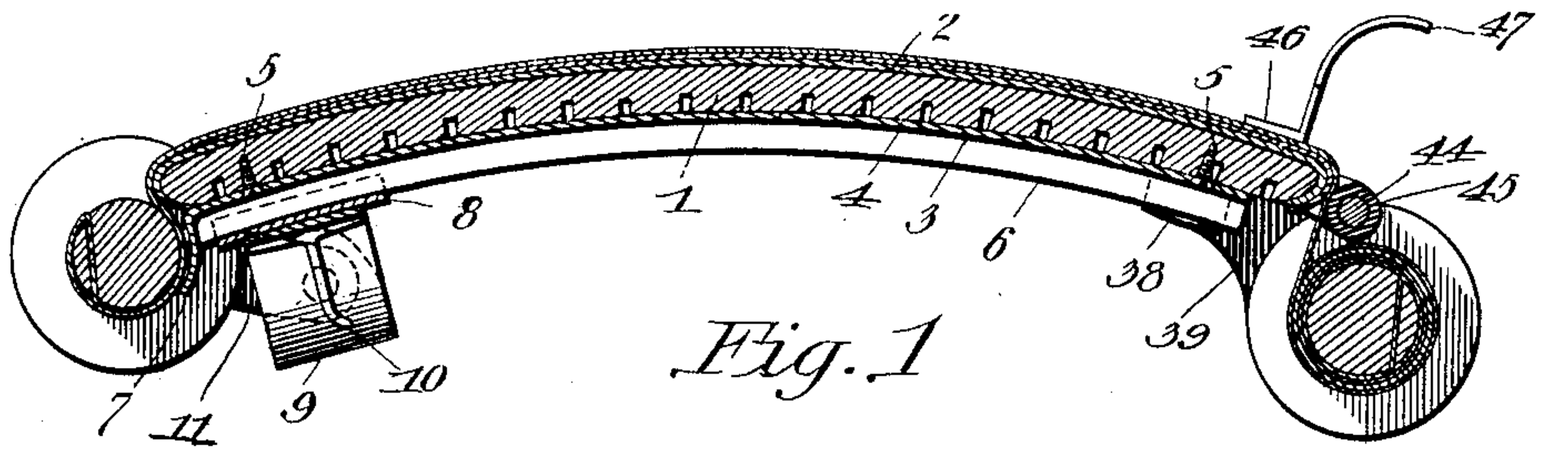

Fig. 1

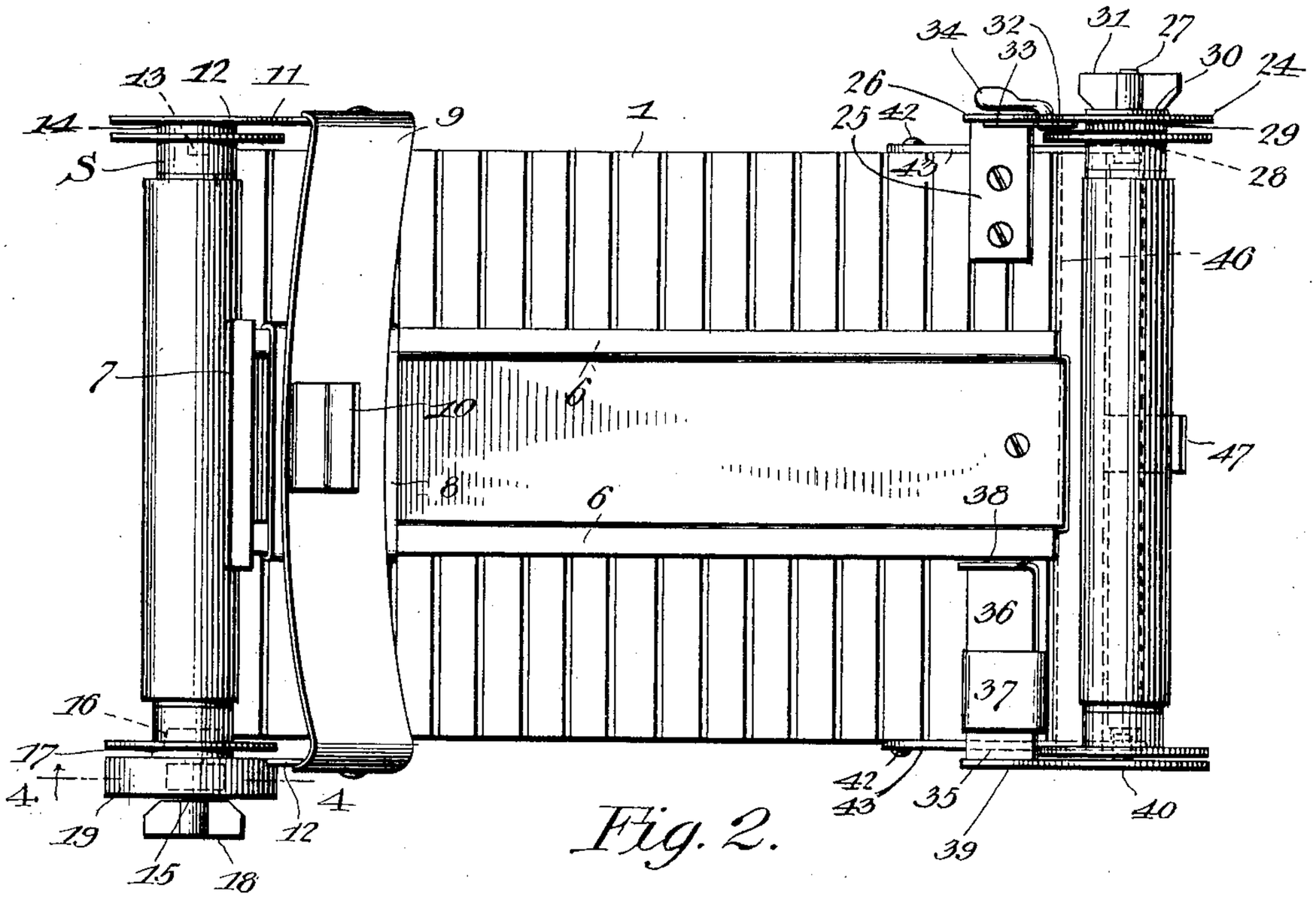

Fig. 2.

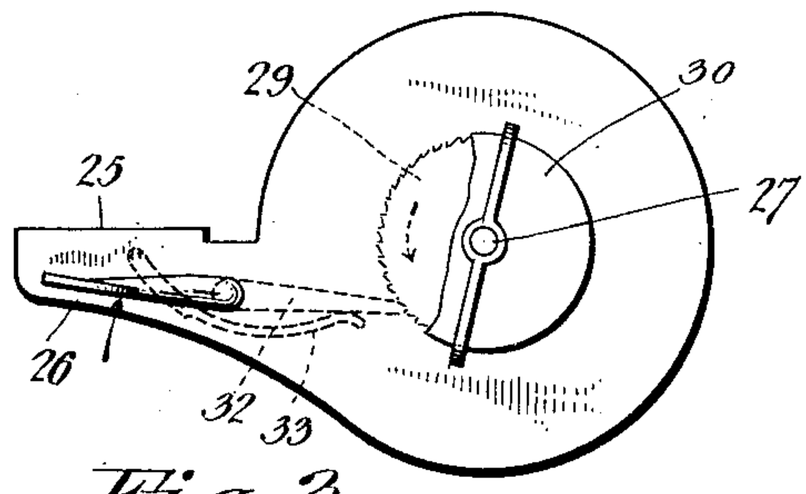

Fig. 3.

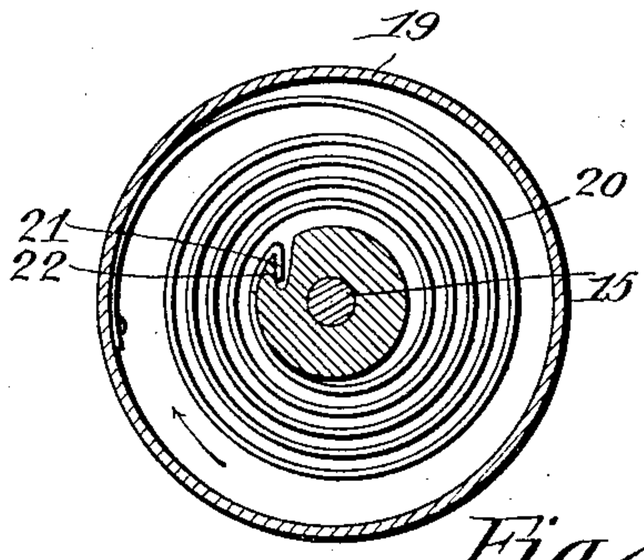

Fig. 4.

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No. 746,234. Patented December 8, 1903.

UNITED STATES PATENT OFFICE.

MILTON W. ARMSTRONG, OF EAST OTTO, NEW YORK.

PHOTOGRAPHIC-PRINTING FRAME.

SPECIFICATION forming part of Letters Patent No. 746,234, dated December 8, 1903.

Application filed March 30, 1903. Serial No. 150,311. (No model.)

To all whom it may concern:

Be it known that I, MILTON W. ARMSTRONG, a citizen of the United States, residing at East Otto, in the county of Cattaraugus and State of New York, have invented a new and useful Photographic-Printing Frame, of which the following is a specification.

My invention relates to photographic-printing frames, and more especially to frames for printing from negatives made on celluloid or other flexible supports.

The object of the invention is to provide a printing-frame by means of which the difficulties of printing from negatives made on celluloid films may be in great measure avoided; and the invention consists in the construction and combination of parts of the photographic-printing frame hereinafter described and claimed, and shown in preferred form in the accompanying drawings, forming a part of this specification, in which corresponding parts are designated by the same characters of reference throughout the various views.

In the drawings, Figure 1 is a view in longitudinal section of a printing-frame constructed in accordance with my invention with film-spools, negative-film, and printing-paper shown in position on the frame. Fig. 2 is a view in rear elevation of the printing-frame shown in section in Fig. 1. Fig. 3 is a detail view in elevation of one of the spool-holding members. Fig. 4 is a sectional view through the casing 19 on the line 4 4 in Fig. 2.

Referring to the drawings in detail, 1 designates a curved plate which forms a support or backing for photographic film and paper during the printing process and to which are attached the other portions of the printing-frame. The curved plate 1 is formed, preferably, of wood, having a series of parallel grooves disposed transversely across the back thereof, as shown, to permit the ready bending of the wood and having on its convex surface a coating 2, of felt or other suitable fabric. On the concave surface or back of the plate 1 is mounted a guide 3, which extends longitudinally of the plate and consists of the central or body portion 4, held in contact with the plate by means of screws 5, disposed near the ends, and the lateral ribs 6, which are held away from the back of the curved plate, as shown. At one end of the guide there is soldered or otherwise fastened thereto a curved metal plate 7, whose utility will presently be explained.

Mounted to slide on the guide 3 and having ends bent to engage the lateral ribs 6 is a reciprocating carrier 8, to which is secured the spring 9 and a lug 10, which forms a handle, whereby the carrier may be readily moved along the guide.

The spring 9 is secured at its middle to the carrier 8, as shown, and is on either side of the point of attachment to the carrier bent away from the plate 1, as shown, but has its ends bent toward the plate, so as to lie in planes substantially perpendicular to said plate.

Pivotally attached to either end of the spring 9 is a support 11 for a spool S, on which is wound the celluloid or other flexible photographic films. One of the supports 11 consists merely of the pivoted plate 12, having a short stud 13 centrally mounted in the main portion thereof and having preferably mounted on the stud 13 a washer 14 to keep the end of the spool from coming into contact with the plate 12, while the other support 11 comprises a plate 12 similar in form to that already mentioned and having rotatably mounted thereon a short shaft 15, terminating at its inner end in a transversely-disposed lug 16 and the flange 17 integral therewith. At the other end the shaft has a lug 18 rigidly secured thereto to form a suitable thumb-and-finger hold when it is desired to rotate the shaft. On the outer surface of the plate 12 and encircling the shaft 15 is a casing 19, secured in any desired manner to the plate 12 and containing a coiled spring 20, the outer end of which is detachably fastened to the casing, as shown, and the inner end of which is bent to form a loop or hook 21, which is adapted to engage with a recess 22 of suitable shape, provided in the portion of the shaft 15, encircled by the casing when the shaft is rotated in the direction indicated by the arrow in Fig. 4, but which disengages from the recess in the shaft when rotated in an opposite direction.

On the back of the plate 1, opposite the point at which the middle plate 17 is attached, are provided another pair of supports for a spool for photographic film. One of these supports,

which is designated as 24, consists of the ear 25, which is secured to the back of the plate 1, as shown, and the portion 26, bent at right angles to the plane of the ear 25 and terminating in a substantially circular end, in the center of which is mounted a short shaft 27, having at the inner end a lug 28 and integral flange 29 and at the outer end a similar flange 30 and a larger lug 31 to form suitable thumb-and-finger hold when it is desired to rotate the shaft.

In order to control the direction of rotation of the shaft 27, the flange 29 is provided on its periphery with small notches, and pivotally mounted in the opening in the portion 26 of the support is a ratchet 32, held by a spring 33 on the inner surface of the said portion 26 of the support in contact with the periphery of the flange 29, thus permitting rotation in the direction indicated in Fig. 3, but normally acting to prevent rotation in the opposite direction.

If it should be at any time desirable to rotate the shaft 27 in the direction opposite to that permitted by the ratchet, it may be done by pressing upon the projection 34 on the outer surface of the portion 26 of the support. This projection 34 is the bent end of the ratchet 32, which extends through the opening in the support 24, in which it is pivoted, and pressure upon it in the direction indicated by the arrow in Fig. 3 will cause disengagement of the ratchet with the flange 29 and permit the shaft 27 to be rotated in the direction opposite to that normally permitted by the ratchet.

Coöperating with the support 24 to hold a spool of film is a support 35, comprising an arm 36, slidably mounted in a guide 37 and having its movement therein limited by the upturned end 38 of the arm 36 and the contact of said upturned end with one of the lateral ribs 6 on the guide 3. The arm 36 is integral with a portion 39 of the support disposed at right angles to said arm and consisting, mainly, of a substantially circular portion having centrally mounted therein a pin or stud 40.

Pivotally attached to the plate 1 by means of screws 42, set in the opposite sides of said plate 1 near the spool-supports 24 and 35 is a clamp, which serves to hold the photographic film and paper in firm contact with one end of the curved plate 1. This clamp consists, preferably, of arms 43, pivoted on the screws 42, above mentioned, and having rigidly mounted between their free ends a rod 44, which is preferably covered with a sleeve 45, of rubber or thin metal, which is rotatable on the rod 44, and an operating-handle, comprising a cross-bar 46, soldered at its ends to the arm 43 and having a hook or finger-piece 47 rigidly attached thereto at about the middle, as shown.

In using my printing-frame an empty film-spool is mounted between the supports 24 and 35, this being readily accomplished by drawing the support 35 outward until the stop 38 comes into contact with the guide-sleeve 37, thus affording sufficient space between the supports 24 and 35 for the introduction of the empty film-spool between them. As ordinarily made, such film-spools are provided with a transverse slot at one end, said slot being adapted to engage readily with a lug, such as 28, and when the spool is placed in position between the supports this slot should be engaged by the lug 28, so that rotation may be imparted to spools by turning the shaft 27. The other end of the spool has a central opening, into which the stud 40 may be readily inserted by forcing the support 35 inward until the stop 38 contacts with one of the ribs 6 on the guide 3. The spool containing the negative wound thereon, with the gelatin side outward, is next introduced between the spool-supports 11, pivotally mounted on the ends of the spring 9. This is readily accomplished by springing said supports outward against the action of the spring sufficiently to introduce the spool between them and spring the stud 13 into engagement with one end and the lug 16 into engagement with the transverse slot provided in the other end of the spool. The spool should of course be in such position that when the outer end of the negative-film is unwound somewhat, so as to be passed under the clamp and secured to the empty spool at the opposite end of the printing-frame, it will unwind from the side of the spool which is adjacent the front surface of the curved plate 1, as shown in the drawings.

In order to attach the outer end of the negative to the empty spool, the film-containing spool is moved by sliding the reciprocating carrier 8 along the guide on the back of the curved plate into proximity with the empty spool. By pulling upon the outer end of the negative-film it will be unwound from the spool which rotates between the supports 11, and the end of the film may be passed under the clamp and inserted into the usual slot provided for that purpose in the empty spool. By then giving the lug 31 a few turns in the direction permitted by the ratchet 32 the end of the film may be wound around an empty spool far enough to bring the first negative of the film into position for printing. The paper to receive the print from the negative is then inserted under the film-containing spool far enough for the end of the paper to be substantially over the end of the plate which is adjacent to the clamp, and the film-containing spool is then moved back to the opposite end of the plate 1 by sliding the reciprocating member 8 along its guide until it contacts with the curved plate 7, which acts as a stop therefor. As the film-containing spool is moved in this direction the spool is rotated between the supports. As the film unwinds rotation is also imparted to the short shaft 15 through the engagement of the lug 16 with the transverse slot in the end of the

spool. This rotation is in the direction which causes the hook 21 at the end of the spring 20 to engage with a recess provided in the shaft 15, and consequently the spring is put under tension. The object of this tension is to insure sufficient strain upon the negative-film to insure proper printing contact with the sensitized paper and the plate 1 and cause the removal of any kinks in the film. When the carrier 8 reaches the end of the guide 3 and comes into contact with the stop 7, the film-containing spool may be forced over the end of the curved plate 1 by the yield of spring 9 and brought into contact with the concave surface of the plate 7, thus leaving the front surface of the curved plate 1 entirely unobstructed and holding the film-spool firmly in position during the printing from the negative upon the paper under it.

When it is desired to examine the print to determine the progress of the printing operation, the film-spool may be forced out of its contact with the plate 7 from the end of the curved plate 1 and moved toward the opposite end of the frame by sliding the carrier 8 along its guide. As the spool is moved toward the opposite end of the frame the tension upon the spring 21 causes the spool to rotate so as to wind up the film on the spool as it moves forward and leaves the end of the print exposed to view without any handling thereof being necessary. After examining the print the film-spool is returned to its position in contact with the curved plate 7 and the process continued as before.

After a sufficient number of prints have been made from the first negative on the film more of the film will be wound upon the spool between the supports 24 and 35 and the second negative unwound from the film-spool, and so on throughout the entire series of negatives on the film.

If it is desired to print from short films containing single negatives, one end of the film and the paper thereunder may be clamped upon the face of the printing-frame by means of the clamp and the other end wound on the spool held between the supports 11, as shown.

It will be seen that with a printing-frame as hereinbefore described it is impossible for the film to curl while the printing-paper is being placed in position; that the whole spool of film may be kept in one piece and stored on the same spool and in the box in which it was purchased; that no means is required to keep the film flat; that the necessity of treating the film with glycerin to make the negatives remain flat is obviated, and hence the tendency of the films to collect dust and lint which is produced by the glycerin treatment is done away with; that with a frame of sufficient width it is possible to print from a film of any length or width that may be desired; that the frame may be used to print panoramic views and such prints be examined without danger of the paper slipping from its proper position; that a print may be examined to determine the progress of the printing process without handling the surface of the paper, and that cut films and roll-films may be used in the printing-frame with equal facility.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination in a photographic-printing frame, of a printing-surface, devices fixed in position at one end of said printing-surface for removably supporting a film-spool, a clamp adjacent to said fixed devices to engage a film, and devices movable on the frame for removably holding the film-spool.

2. The combination in a photographic-printing frame, of a printing-surface, devices fixed at one end of said printing-suface for removably supporting a film-spool, ratchet-controlled winding mechanism provided on said spool-supporting devices, and devices movable on the printing-frame for removably supporting a film-spool.

3. The combination in a photographic-printing frame, of a curved plate whose convex face forms a printing-surface, devices for removably supporting a film-spool fixed in position at one end of said printing-surface, a member slidably mounted on the concave surface of said curved plate, and devices for removably supporting a film-spool mounted on said slidable member.

4. The combination in a photographic-printing frame, of a plate forming a printing-surface, devices for removably supporting a film-spool fixed at one end of said plate upon one face thereof, longitudinal guides on the opposite face of said plate, a member mounted to slide on said guides, and devices for removably supporting a film-spool carried by said member.

5. The combination in a photographic-printing frame of a curved plate having a convex face forming a printing-surface, stationary spool-supporting devices at one end of said plate, a longitudinally-disposed guide on the concave surface of said plate, a carrier slidably mounted on said guide, a spring attached to said carrier and having pivotally secured to its ends supporting devices for a film-spool, and a stop at one end of said guide to limit the movement of said slidable member thereon.

6. The combination in a photographic-printing frame of a curved plate having its convex face adapted to form a printing-surface, stationary spool-supporting devices at one end of said plate, spring-supported movable spool-supporting devices at the opposite end of said plate, and a projection against which the film-spool is held by said movable supporting devices.

7. The combination in a photographic-printing frame of a plate having a printing-surface, devices at one end of said plate to grip the photographic film and hold it in contact with said printing-surface, and movable spool-supporting devices which may be brought

into juxtaposition with said gripping devices and moved to the opposite end of said plate, said spool-supporting devices being provided with means for yieldably opposing the rotation of the spool held between them when turned in one direction and to permit their rotation in the opposite direction.

8. The combination in a photographic frame of spool-supporting devices comprising a shaft having a lug adapted to engage a transverse slot in the end of a film-spool, and a coiled spring wound around said shaft and adapted to yieldably oppose rotation thereof in one direction and to permit free rotation in the opposite direction.

9. The combination in a photographic-printing frame of a plate one of whose faces forms a printing-surface, a clamp adapted to hold the photographic film and paper in contact with said printing-surface, said clamp comprising pivoted arms, and a cross-rod between said arms completely encircled by a sleeve rotatable thereon and adapted to be brought into clamping contact with one end of said plate.

10. The combination in a photographic-printing frame of a plate one face of which forms a printing-surface and a clamp adapted to hold a photographic film and paper in contact with said printing-surface, said clamp comprising pivoted arms, a cross-rod between said arms encircled by a sleeve of elastic material and adapted to be brought into clamping contact with the end of said plate.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

MILTON W. ARMSTRONG.

Witnesses:
JOHN P. MATTESON,
MARC L. ELLSWORTH.