

**No. 646,664.**

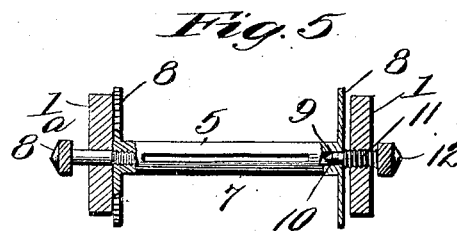
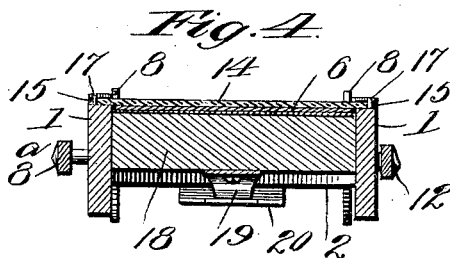
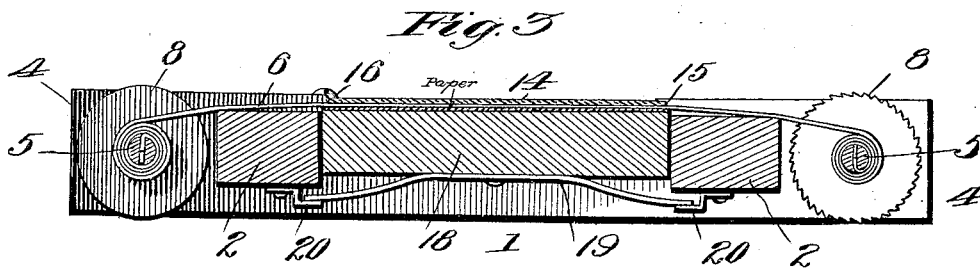
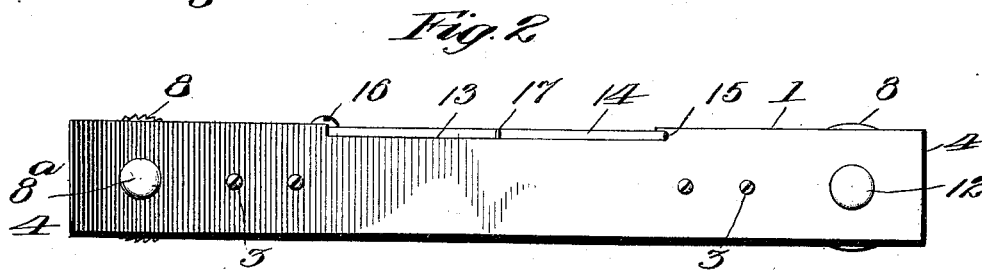
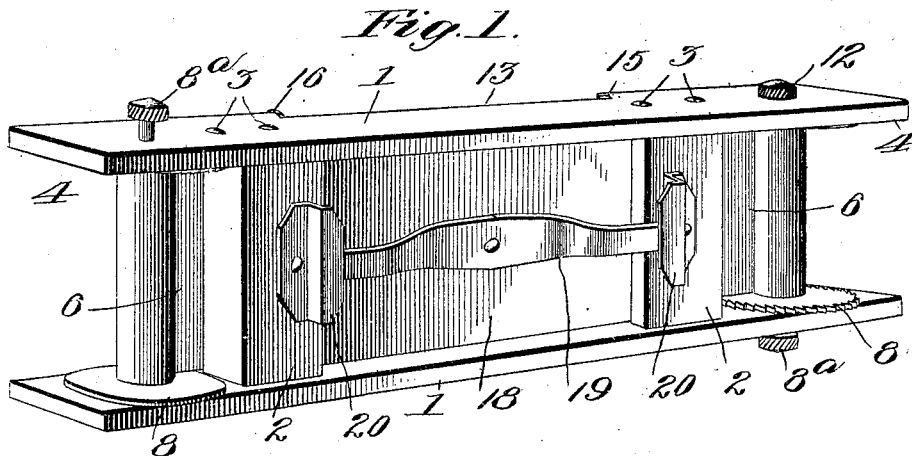
**Patented Apr. 3, 1900.**

W. HULL.

PHOTOGRAPHIC PRINTING FRAME.

(Application filed Dec. 15, 1899.)

(No Model.)



Witnesses  
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# UNITED STATES PATENT OFFICE.

WARREN HULL, OF GASPORT, NEW YORK.

## PHOTOGRAPHIC-PRINTING FRAME.

SPECIFICATION forming part of Letters Patent No. 646,664, dated April 3, 1900.

Application filed December 15, 1899. Serial No. 740,437. (No model.)

*To all whom it may concern:*

Be it known that I, WARREN HULL, a citizen of the United States, residing at Gasport, in the county of Niagara and State of New York, have invented a new and useful Photographic-Printing Frame, of which the following is a specification.

The object of this invention is to provide a photographic-printing frame especially designed for the purpose of making photographic prints from film-negatives in the form of a continuous strip, thereby rendering it unnecessary to cut or divide the strip of film into pieces corresponding in size with the negative. In printing from films difficulty is always experienced in securing a perfect contact between the film and the sensitized paper owing to the fact that the film has a decided tendency to buckle or roll up at its edges. This makes it a matter of considerable difficulty to place a sheet of sensitized paper upon the film, it being necessary to hold down the corners of the film with the fingers and also to place the back of the frame in place without allowing the film to roll or buckle, which would result in the film and negative being creased and injured by the pressure of the back. By means of the construction hereinafter shown and described the tendency of the film to buckle is obviated, the same is held perfectly flat by the particular arrangement of the parts of the frame, and the operator experiences no difficulty in placing the sensitized paper against the film and subsequently applying and fastening in place of the back.

The detailed objects and advantages of the invention will appear in the course of the ensuing description.

The invention consists in a printing-frame embodying certain novel features and details of construction and arrangements of parts, as hereinafter fully described, illustrated in the drawings, and incorporated in the claim.

In the accompanying drawings, Figure 1 is a perspective view of a printing-frame constructed in accordance with the present invention. Fig. 2 is a side elevation of the same. Fig. 3 is a longitudinal section through the frame. Fig. 4 is a cross-section taken centrally through the same. Fig. 5 is a cross-

section taken in line with the axis of one of the rollers or spools.

Similar numerals of reference designate corresponding parts in all the figures of the drawings.

The printing-frame contemplated in this invention comprises, essentially, a pair of side bars 1, arranged parallel to each other and connected by means of cross-bars 2, which are preferably fitted between the side bars and secured rigidly thereto by fasteners 3. The side bars and cross-bars are arranged at such distances apart as to form an exposure-opening between them of a size equal to but preferably slightly larger than the superficial area of the negative from which the print is to be made. The side bars 1 project beyond the cross-bars 2 to form longitudinal end extensions 4, in which are removably journaled the rollers or spools 5, upon which the continuous-strip of film-negative (indicated at 6) is adapted to be wound. Each spool comprises a hub portion or center 7 and end flanges 8, spaced apart a distance equal to or greater than the width of the strip of film which is adapted to be wound on the spool between said flanges. The opposite ends of the spool are provided with longitudinal bores or sockets 9, in which are received the smooth-pointed shanks 10 of bearing screws or spindles 11, provided at their outer ends with milled heads 8<sup>a</sup> and 12, by means of which they may be turned and removed.

In my printing-frame the extended end portions 4 of the side bars are provided with clamping and pivotal screws for the film-spools. As shown by Fig. 5 of the drawings, the screws provided in the extended end portions of one side bar are each provided with a smooth journal portion and a threaded extremity, the journal portion of each screw being located between the threaded and headed ends thereof, so that the screw may turn freely in the side bar. The other side bar of the frame carries at its extended portions the other screws, which are in coaxial relation to the first-named screws. Each of these last-named screws is formed with a head 12 at one end, a smooth journal portion 9 at its other end, and a threaded portion between the headed and

journal portions. These threaded portions of the said screws work in the extended end portions of the side bar. The terminal of the thread adjacent to the smooth journal portion 9 provides a shoulder which is adapted to abut or bind against the head of a film-spool.

It is the common practice to remove the film-spools from cameras in developing the film and to wind the developed film on the spool. The construction of my frame with the pairs of journal and clamping screws enables ordinary film-spools to be applied operatively to the frame and on opposite sides of the exposure-opening. A spool may be fitted readily between the extended end portions 4 of the side bars, so as to bring the hollow shaft or hub of the spool in coaxial relation to and between the screws. The screw with its threaded inner end may be turned in its bearing of one side bar, so as to engage with threads within the hub at one end of the spool, as shown by Fig. 5, for the purpose of making the spool fast with the screw, and thereby adapting the spool to turn with the screw. The other screw in the other side bar of the frame may be rotated, so as to advance the smooth journal portion 9 thereof into the hub of the spool, and the spool may thus turn idly on the journal portion 9 of one screw when the other screw is rotated. In order to lock the spool against rotation, the screw with the smooth journal portion may be turned in its bearing of the side bar, so as to make the shoulder bind against a head of the spool, and thereby by clamp the spool between the shouldered screw and one side bar of the frame.

It is to be observed that the cross-bars 2 are secured between the side bars of the frame, so as to present broad guide-surfaces, which lie in the same plane and to one side of the path of a film in passing from one spool to the other. The spools may be adjusted so that they may turn on their axes, or the screws may be manipulated to clamp the spools, whereby the film may be held under tension. In view of the fact that the spools are controllable, so as to maintain the film under tension, and owing to the arrangement of the cross-bars to present the broad guide-surfaces the film is kept in a taut condition and in engagement with the cross-bars 2, so as to prevent the edges of said film from curling, whereby the film is normally kept in a condition which permits the operator to place the sensitized paper against the film without having to smooth or adjust the film preliminary to placing the paper in position for the printing operation. Each of the spools is equipped with these tightening devices, by means of which it may be held from rotating and the film maintained under tension.

The side bars 1 are provided in their outer edges with longitudinal depressions or recesses 13, in which are received the opposite edges of a glass or transparent panel 14, against which the film bears and finds its support during the process of printing. The glass

panel is arranged parallel to and at one side of the plane of movement of the film in its passage from one roller to the other. The end edges of the glass panel are arranged parallel with the cross-bars 2 and at a sufficient distance therefrom to leave a clearance space or passage for the film, which travels between the glass and said cross-bars, the cross-bars thus serving to bear against the edges of the film and assist in preventing said edges from rolling or curling. In order to hold the glass in place, the side bars are provided at the ends of the recesses 13 with notches 15, undercut so as to form overhanging portions which engage the outer surface of the glass, as clearly shown in the drawings. Supplemental to the notches 15 headed pins or screws 16 may be employed adjacent to the corners of the glass, the heads thereof overhanging and bearing against the outer surface of the glass. Pins 17 may also be employed to prevent lateral displacement of the glass, the said pins being driven into the side bars by the edges of the glass.

In connection with the printing-frame above described I employ a back 18, of any usual or preferred construction, provided with the usual clamping or holding spring-bar 19, the opposite extremities of which are adapted to be engaged under a pair of keepers 20, secured to the rear sides of the cross-bars 2.

By means of the construction described it will be seen that I have provided an exceedingly cheap and simple printing-frame for strips of film-negatives, in which provision is made for effectually holding the film flat while printing and while applying the sensitized paper to the film. It will be seen that the cross-bars are of material assistance in preventing the longitudinal edges of the film from rolling or curling, the glass assisting the cross-bars in maintaining the film in a flat condition. This enables a piece of sensitized paper to be laid upon the film and the back applied without any tendency of the film to roll or curl. It will also be seen that the film may readily be wound from one spool to another and the spools tightened or clamped, so as to prevent them from turning backward, thus maintaining the film under tension. The shafts or spindles of the spools or rollers may be provided with any desired means, such as longitudinal slots, for engaging the ends of the film preparatory to winding the film thereon.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

A printing-frame for strips of film-negatives comprising the cross-bars, the side bars united to the cross-bars, forming therewith the exposure-opening, and having the ends extended beyond the cross-bars, shouldered screws having threaded engagement with the extensions of one side bar and each provided at its inner extremity with a smooth journal portion, other screws journaled in smooth bearings in the other side-bar extensions and in alined relation to the first-named screws,

a glass secured in the side bars at one side of the path of a film-strip, and a back, substantially as described.

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

WARREN HULL.

Witnesses:

WILLIS HALSTEAD,  
SAMUEL MESLER.