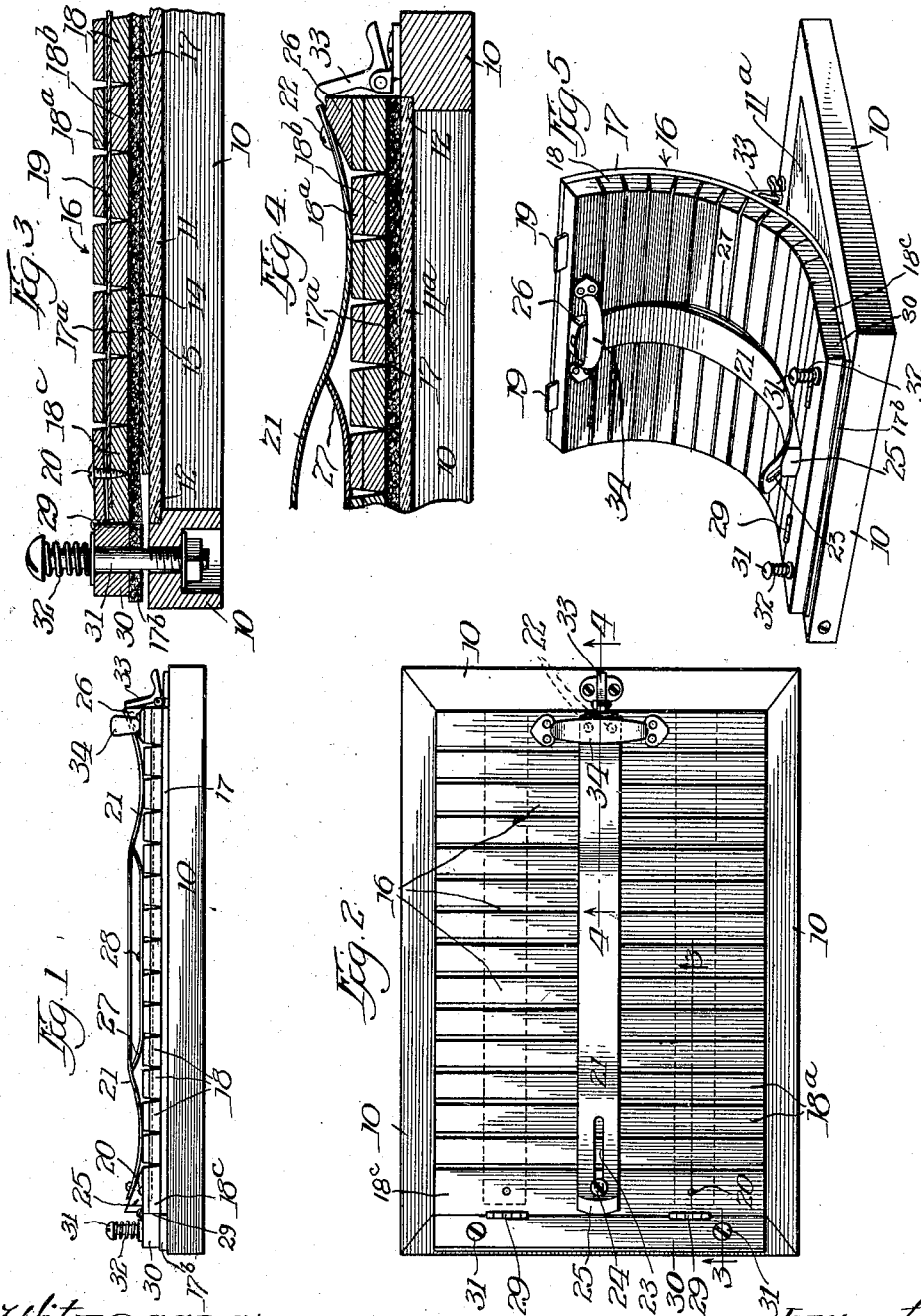


1,144,014.

Patented June 22, 1915.



Witnesses:
F. C. Brown
C. H. Brown

Inventor:
Wilhelm Westman
By Luther Johns, Atty.

UNITED STATES PATENT OFFICE.

WILHELM WESTMAN, OF LOS ANGELES, CALIFORNIA, ASSIGNOR OF ONE-HALF TO
ERNEST WILLIAMS, OF LOS ANGELES, CALIFORNIA.

PRINTING-FRAME.

1,144,014.

Specification of Letters Patent.

Patented June 22, 1915.

Application filed December 14, 1914. Serial No. 877,003.

To all whom it may concern:

Be it known that I, WILHELM WESTMAN, a citizen of the United States, and resident of Los Angeles, Los Angeles county, State of California, have invented certain new and useful Improvements in Printing-Frames, of which the following is a specification.

My invention relates to printing frames, and more particularly to such as are adapted to be employed in photographic, blue print, and similar processes in which negative and positive printing elements are held face to face for printing through one upon the other. Its principal objects are to provide a printing frame in which the positive and negative printing elements may be positioned and adjusted accurately with celerity and ease, maintained tightly upon each other during the printing operation, and examined easily and quickly from time to time and, notably, throughout or substantially throughout their printing areas respectively; also, a frame in which such extensive examination may be had without prejudice to the perfect adjustment necessarily to be maintained between the printing elements after the printing has been begun; and, structurally, to provide a frame which is simple, strong and durable, operates smoothly, and is not likely soon to get out of order.

Other objects and advantages will appear hereinafter.

In the accompanying drawings, which form a part of this specification, I have illustrated a preferred embodiment of my present invention as applied to a printing frame suitable for photographic reproductions and the like, in which drawings—

Figure 1 is a side elevation of the device complete; Fig. 2 is a top plan of the same; Fig. 3 is an enlarged fragmentary longitudinal vertical section through the device of Fig. 1, as on the broken line 3—3 of Fig. 2, certain outer spring elements not being shown; Fig. 4 is a similar sectional view, as on the line 4—4 of Fig. 2, the positive and negative printing elements of Fig. 3 not being included; and Fig. 5 is a perspective view of the device in its normal open position.

The frame proper 10 is suitably rectangular in shape and is provided with means for holding a plate, as 11 or 11^a, such means being preferably a shoulder or seat formed

by rabbeting the recess 12 in the frame as shown. The plate 11^a, Fig. 4, is to be considered the usual and ordinary glass plate negative, the plate 11 being considered a light-transmitting support (preferably transparent glass) for the negative, as 14, which negative 14 may also be of glass (as where the same is too small to be held by its edge portions in the frame), or it may be of paper, celluloid and the like flexible substances requiring a support or backing such as the plate 11. The sensitized sheet or positive printing element 15 is shown in printing position upon the negative 14.

In this description and in the claims wherever the term "printing element" is employed it will be understood to refer either to the "positive" or the "negative," or the equivalent, or, in the plural, to both, such "printing elements" being the articles held by the frame and are not to be understood as included as elements of the printing frame itself, the coöperative elements of the combinations set forth being technically printing-frame elements as distinguished from printing elements.

Printing frames of the general character described are provided with a pressure back for holding the printing elements face to face. In my improved device the pressure back 16 is flexible and is also resilient. Means are provided in my device for maintaining the resilient back in its straightened-out shape for holding the printing elements, such means being preferably positioned at the ends, and are illustrated as hinges and a latch, although the invention is not limited to such means. Means are also provided for causing the back to exert a holding pressure intermediate its ends, the means illustrated being also susceptible of modification.

The flexible and resilient back 16 comprises first a flexible mat or cushion element 17, which is preferably of substantially heavy felt or similar fabric, and this mat or cushion element should be of sufficient area to cover the printing elements, and ordinarily covers the plate 11 or 11^a. A layer of canvas, 17^a, is preferably cemented to the cushion 17 for strength. A plurality of bars 18, with their sides tapering from the bottom to the top as shown, to provide clearance, and extending parallel to each other, and preferably of a length equal to

the width of the mat 17, are secured to the mat or cushion close to each other, or to the canvas or similar fabric 17^a where it is employed, preferably by cement, substantially as shown. The bars 18 are preferably made in upper and lower pieces 18^a and 18^b, a transverse groove being formed in the end portions of one of these parts, for instance 18^b, to provide confinement for the springs 19, shown as flat pieces of metal and preferably made of light band steel, these elements 19 being preferably given an initial curve, so that they are arcuate or curved in form before being positioned in the bars 18, so that when these springs 19 are in the position shown in Fig. 1 their tendency is to resume their arcuate or curved shape, as in Fig. 5, when free to do so, their action in practice being to cooperate in automatically raising the free end of this flexible back. One end of each of the springs 19, preferably as shown, is secured against relative movement in the hinge bar 18^c, as by the screws 20, these spring elements 19 being free to move in the bars to provide flexibility of the back as a whole.

Additional means for drawing the pressure back into the curved form shown in Fig. 5 comprise the spring element 21, which is also suitably of flat band steel, this element 21 being rigidly secured at one end to one of the bar elements, preferably the free or front end element, as by the screws 22, the other end having means for permitting relative movement, as the slot 23 through which passes the screw 24, the head thereof preventing this end from getting out of its operative position. The spring 21 is also initially curved substantially as are the springs 19, its tendency and effect being also to cooperate in drawing the flexible back into a curved shape. The normally curved form of springs 19 and 21 have the additional function of causing the bars 18 to press equably upon the plate 11 or 11^a, or whatever may be upon such plate, when the flexible back is in the position of Fig. 1. In the case of spring 21 I prefer to have the ends incline upward, as in Fig. 5, which is accomplished by the blocks 25 and 26 having inclined faces, these blocks being rigid upon the end bars respectively.

While the device operates effectively with only the springs 19, or their equivalent, and with better pressing effect with the spring 21 contacting the upper surface of the bars 18 substantially from end to end of the flexible pressure back 16, as would be the case if the spring element 27 were removed, I obtain a still better holding effect by the interposition of this spring element 27, suitably also a piece of light band steel, between the middle bars 18 and the spring 21, this spring 27 preferably having its ends upturned as shown and being secured rig-

idly to say the intermediate bar 18, as by a screw or screws 28. Thus the holding pressure of the spring 21 is increased and is exerted equably over a considerable number of the intermediate bars 18. Other portions of the spring 21 may contact other bars 18, as illustrated in Figs. 1 and 4.

The hinges 29 are connected to the end bar 18^c and the anchoring bar 30, which is supported for up and down movement on the bolts 31 held by the frame 10, a spring, as 32, being interposed between the head of the bolt and the anchoring bar 30 adapted to press this bar 30 and consequently the end of the pressure back 18 toward the frame proper 10, yet permitting these parts to rise against spring pressure when articles, for instance the negative 14 and the sensitized sheet 15, are interposed between the plate 11 and the back 18, and adapts the device to holding in proper position printing elements of various thicknesses. As illustrated in Fig. 3, a washer 17^b, suitably of the same material as the mat element 17, is positioned between the bar 30 and frame 10, the same providing a cushion for the bar 30. A latch element, as 33, holds the free end of the flexible back 16 in its straightened-out or printing position. A handle, as 34, is preferably positioned substantially as shown in order that when the pressure back is forced into the position of Fig. 1 the force exerted may be applied centrally of the back and the back be thus moved uniformly into the holding position and latched.

From its position as shown in Fig. 5 the back 16 may be moved on the hinges 29 so as to expose the entire top surface of the plate 11 or 11^a, thus providing a free and unobstructed surface upon which to position a printing element or elements as the case may be. The operator may begin with the back 16 thus entirely away from the plate 11 or 11^a, or he may begin with the parts in the normally open position of Fig. 5, in which case he takes the printing element or elements and, raising the back 16 slightly, inserts limited end portions of the printing element or elements beyond the normal line of contact of the back 16 with the plate 11 or 11^a, allowing the back 16 again to descend by reason of its own weight. Thus end portions of the printing element or elements are held, and the operator may readily adjust them, raising the back 16 slightly from time to time if necessary. This manner of applying the printing elements to the frame is highly advantageous, not only with respect to the freedom and quickness with which the operator may work, making for better results, but also notably in such printing operations as include flexible films and the like which curl and roll upon themselves and are ordinarily difficult of positioning and ad-

justing in a frame. In this device it is possible for the operator to engage one end of such curling elements by the back 16 and straighten them out with one hand as he causes the flexible back to roll down or creep upon them with the other.

When the operator desires to examine the positive, which he usually does several times during a printing operation, he operates the catch element 33 to release the back 16 whereupon the back will automatically assume its relative position shown in Fig. 5, its weight still holding end portions of the positive, in which open position the operator may quickly examine in one view substantially the entire printing area, or all of it if there is a margin about the printing area, as is usually the case. Having made an examination the back 16 is simply pressed down and latched.

While I have illustrated and described a preferred embodiment of these improvements, the invention is not limited to the specific construction shown and reference should be had to the appended claims to determine the scope of the invention herein set forth.

I claim:

1. The combination of a frame for holding a printing element for light transmission therethrough, and flexible means for holding a sensitized sheet in printing position upon such printing element, said flexible means including a plurality of pressure bars side by side and transversely apertured at end portions respectively to accommodate a pair of springs, normally curved springs in said apertures respectively, said springs being adapted to cause end portions of said flexible means normally to curl away from said frame, and means for holding said flexible means in substantially flat position on said frame.

2. In a printing frame, the combination of means for supporting printing elements in printing relation, and a resilient flexible articulated pressure back for said supporting means, the construction of said pressure back being such that when one end thereof is held on said supporting means the free portion thereof is curled away from said supporting means, automatically adjustable hinge means for so holding one end of said pressure back, and means coöperating with said hinge means for holding said pressure back substantially straightened out upon said supporting means whereby printing elements may be held when positioned in said printing frame.

3. The combination of a printing frame proper adapted to hold a printing element for light transmission therethrough, an articulated pressure back adapted to cover such printing element when so positioned and to hold thereon a sensitized sheet for

printing, the articulated construction of said pressure back being such that an end portion thereof may be turned back by degrees to expose successive relatively small portions of such sheet when so positioned, means for holding end portions of said back in printing element holding position, and a spring element carried by said articulated back adapted to impart printing element holding pressure upon portions thereof intermediate its ends.

4. The combination of a printing frame proper having provisions for holding a printing element for light transmission therethrough, and a resilient back for holding a sensitized sheet in printing position upon such printing element when in said frame proper, said resilient back comprising pressure bars side by side and spring means adapted normally to cause a free end of said back to stand away from said frame proper in an open position, means for holding end portions of said back in printing element holding position, and means for holding intermediate portions of said back in such holding position.

5. The combination of means for holding a printing element for light transmission therethrough, and a flexible pressure back adapted to hold another printing element upon such first mentioned printing element, said pressure back including transverse pressure elements side by side and adapted to move away from said printing element holding means by successive steps until such printing elements, when held by said means and said back, are exposed, said pressure back being adapted to creep upon successive small portions of such printing elements when so positioned that the pressure back is out of holding position and is brought into holding position on said means, means for holding the end portions of said pressure back in printing element holding position on said other means, and spring means adapted to hold intermediate portions of said pressure back in such holding position.

6. In a printing frame, the combination of a frame proper adapted to support printing elements for printing, and a resilient pressure back for said frame, said pressure back including transverse bars side by side and spring means thereon normally tending to assume a curved shape, hinge means for securing said pressure back at one end thereof to said frame proper whereby the convex portion thereof is toward said frame proper, and means for releasably holding the other end of said back on said frame whereby said pressure back is substantially straightened out thereon.

7. In a printing frame, the combination of a frame proper adapted to hold a print-

ing element for light transmission there-
through, and a resilient flexible pressure
back hingedly mounted on said frame
proper, said pressure back being adapted
5 normally to curl away from said frame
proper and from a printing element when
held thereby, means for holding the free
end of said flexible back, and spring means
adapted to bear upon intermediate portions
10 thereof whereby such intermediate portions
may press upon such printing element
when so positioned.

8. In a printing frame, the combination
of a frame proper adapted to support a
15 printing element for light transmission
therethrough, and a resilient pressure back
for said frame, said pressure back com-
prising a plurality of bars connected to-
gether flexibly side by side and a plurality
20 of normally curved springs, said springs
normally tending to cause said pressure
back as a whole to assume a curved shape
with its convex portion toward said frame
proper, and means for holding said pres-
25 sure back in substantially flattened out po-
sition on said frame proper.

9. In a printing frame, the combination
of a frame proper having provisions for
holding a printing element, a resilient pres-
30 sure back for said frame proper, said pres-
sure back comprising a flexible mat ele-
ment, a plurality of bars on said mat ele-
ment, and spring means adapted to main-
tain said mat element in pressing relation
35 to such printing element when said pres-
sure back is in holding position on said
frame proper and such printing element is
positioned therein.

10. In a printing frame, the combination
of a frame proper having provisions for
40 holding a printing element, a resilient pres-
sure back for said frame proper, said pres-
sure back comprising a flexible mat ele-
ment, a plurality of bars on said mat ele-
ment, and a normally curved spring
45 element extending transversely of said
bars and adapted to maintain said pres-
sure back as a whole in a normally curved
shape with the convex portion toward said
frame proper and means for holding said
50 pressure back substantially flattened out
upon said frame proper.

11. In a printing device, the combina-
tion of a frame proper having provisions
for holding a glass negative, a flexible pres-
55 sure back for said frame proper adapted to
hold a sensitized sheet upon such negative
when in said frame, said pressure back com-
prising a flexible mat element and a plu-
rality of bars side by side upon said mat
60 element, a pair of spring elements arranged
transversely of said bars, carried thereby,
and adapted normally to assume a convex
shape toward said frame proper, means in-
cluding an automatically adjustable hinge
65 element for holding the ends of said back
upon said frame proper and spring means
for holding intermediate portions of said
back whereby said back is substantially
70 straightened out upon such negative and
sheet when positioned in said device.

WILHELM WESTMAN.

Witnesses:

DAVID J. SHEAHAN,
S. N. COULTER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."