

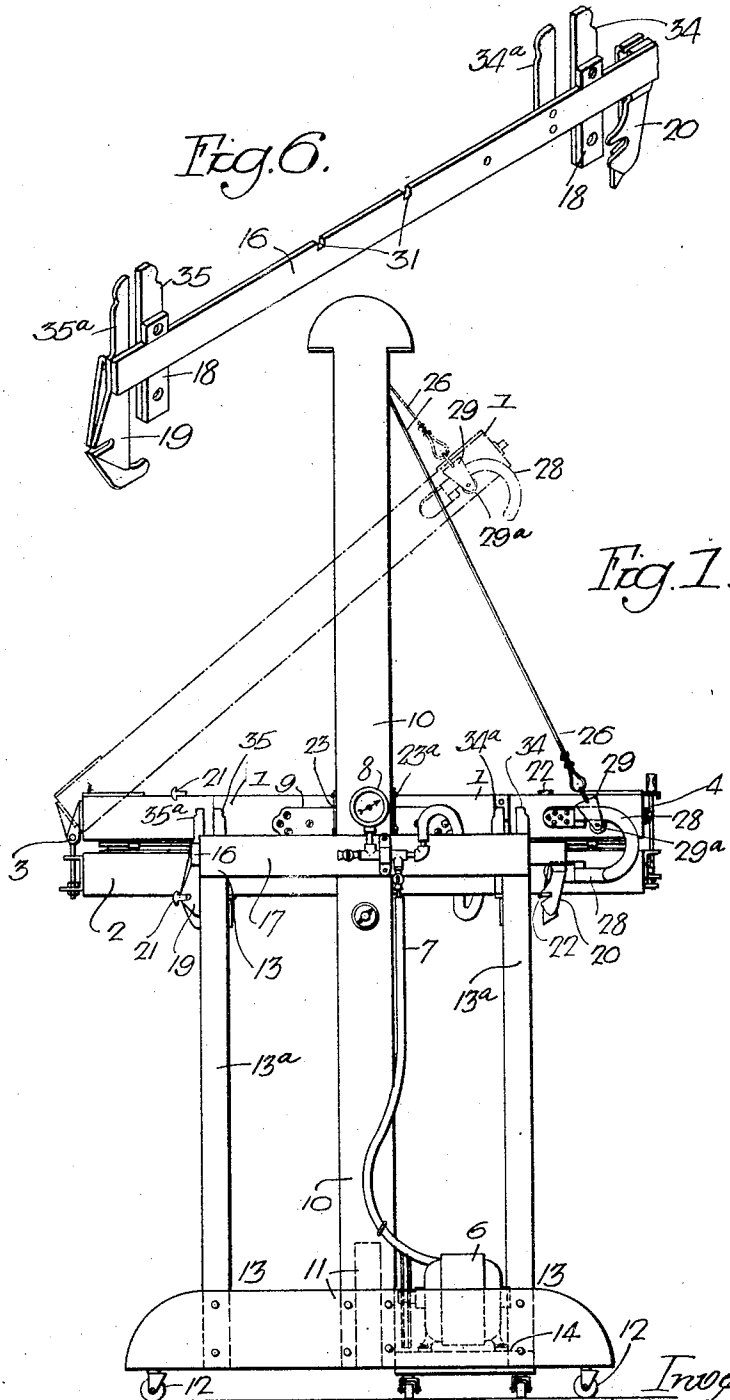
Aug. 19, 1924.

1,505,818

E. W. SWEIGARD
VACUUM PRINTING FRAME

Filed July 13, 1922

4 Sheets-Sheet 1.



Inventor
Emanuel W. Sweigard
by his Attorneys
Sturges & Sturges

Aug. 19, 1924.

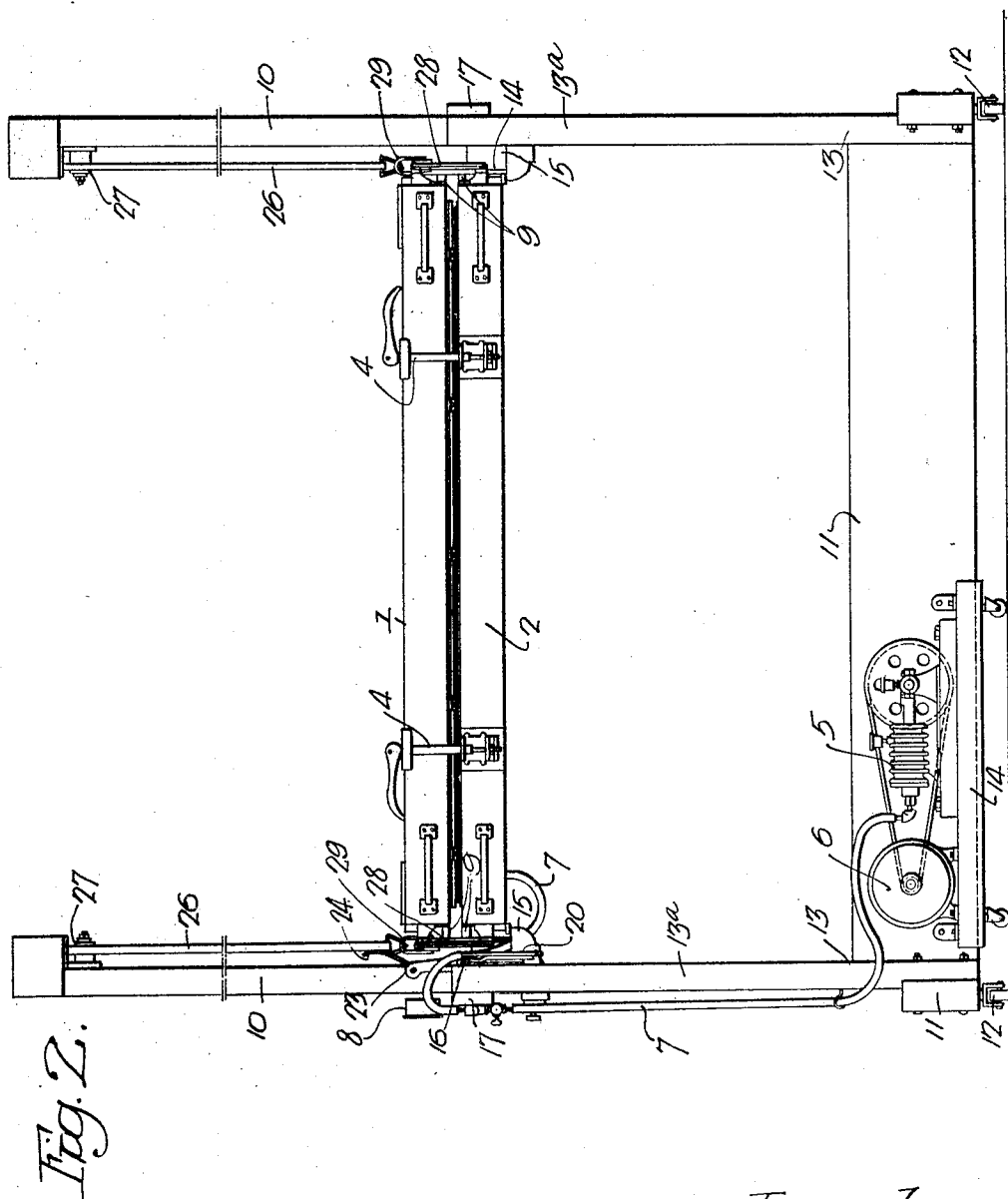
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4 Sheets-Sheet 2



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Aug. 19, 1924.

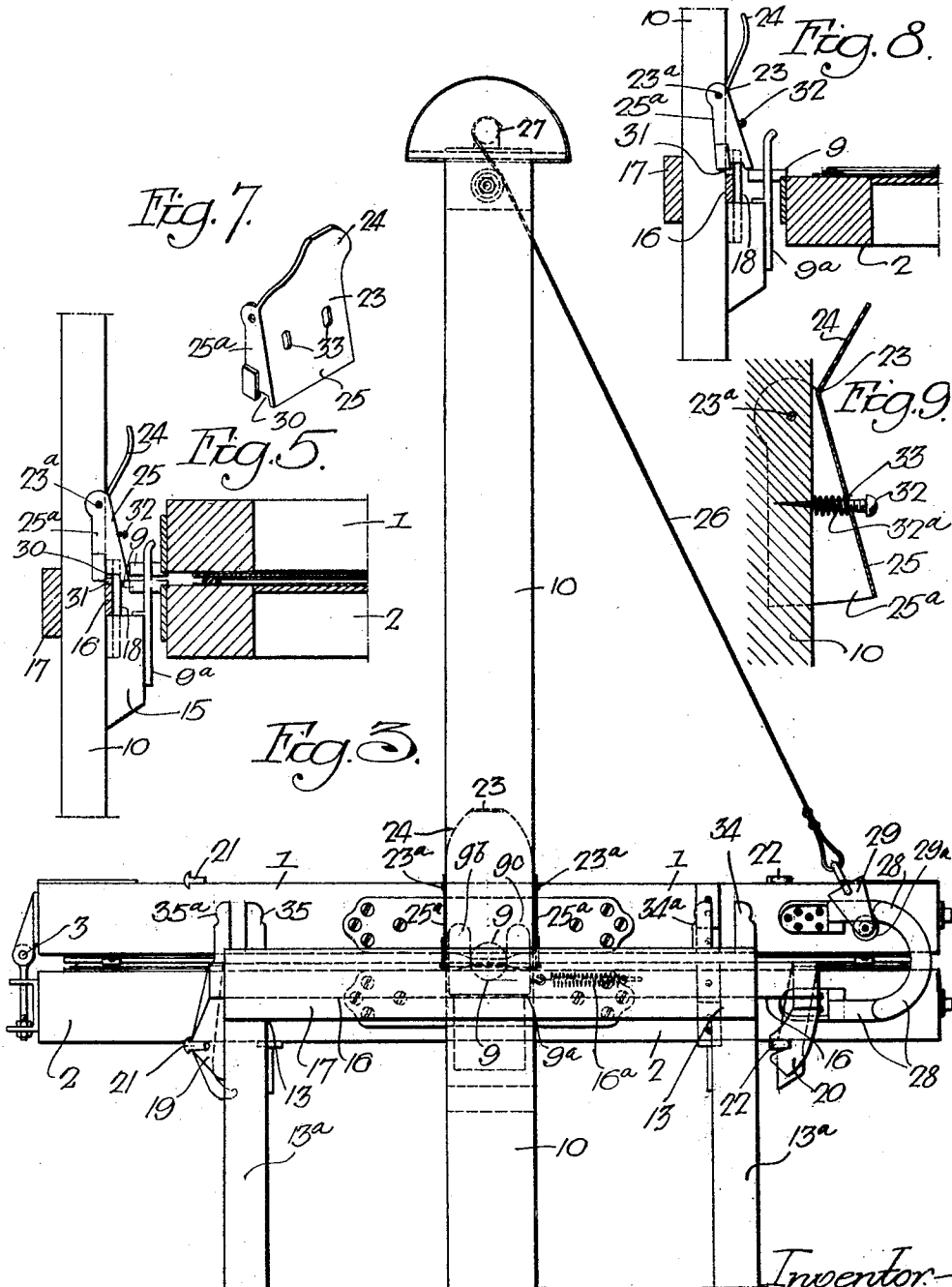
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4 Sheets-Sheet 3



Inventor-
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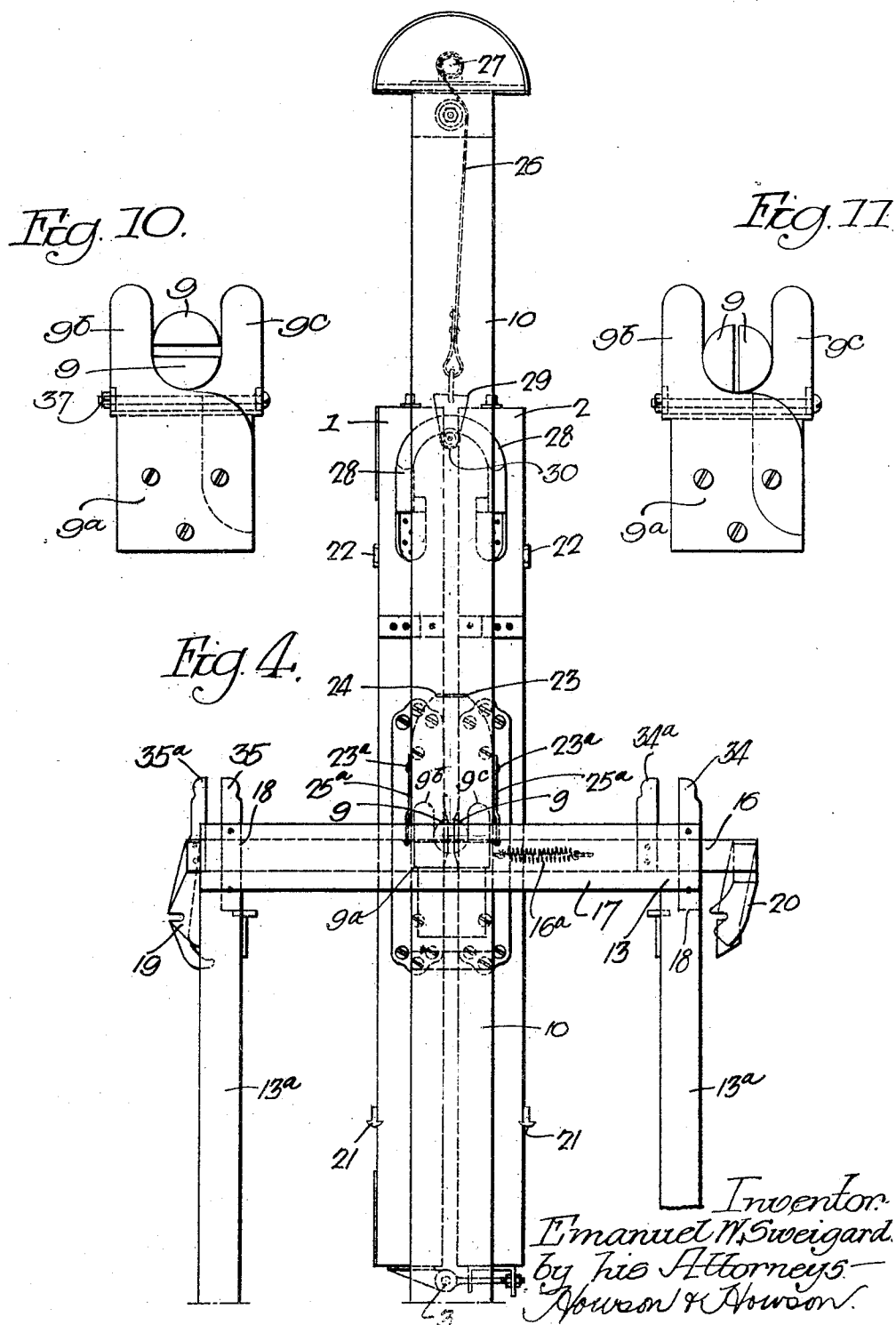
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E. W. SWEIGARD

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4 Sheets-Sheet 4



UNITED STATES PATENT OFFICE.

EMANUEL W. SWEIGARD, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO SWEIGARD IDEAL CO., OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF DELAWARE.

VACUUM PRINTING FRAME.

Application filed July 13, 1922. Serial No. 574,672.

To all whom it may concern:

Be it known that I, EMANUEL W. SWEIGARD, a citizen of the United States, residing in Los Angeles, California, have invented certain Improvements in Vacuum Printing Frames, of which the following is a specification.

The principal object of this invention is to provide a printing frame of the vacuum type which is reversible in the sense that it may be used with either the glass or the blanket uppermost as desired by the operator, the adjustment of the frame from one position to another being an extremely simple operation requiring no manipulation other than the mere shifting of the frame itself. The invention further resides in the provision of certain improving elements and details of construction hereinafter fully described.

The invention will be more readily understood by reference to the attached drawings, in which:

Figure 1, is a side elevation of a printing frame and its support made in accordance with my invention;

Fig. 2, is a front elevation of the frame;

Fig. 3, is a side elevation of the upper portion of the frame illustrating details of my invention;

Fig. 4, is a partial side elevation of the frame illustrating the latter in a position of transition from one position to another;

Fig. 5, is a fragmentary section of one end of the frame and a portion of the supporting structure illustrating details of the construction;

Fig. 6, is a view in perspective of the locking bar;

Fig. 7, is a view in perspective of the locking bar safety catch;

Fig. 8, is a fragmentary section similar to Fig. 5, illustrating operation of the devices;

Fig. 9, is a fragmentary section illustrating further details, and

Figs. 10 and 11, are fragmentary side elevations of the trunnion bearing brackets and frame trunnions.

With reference to the drawings, the apparatus comprises a vacuum printing frame of well known type consisting of a glass supporting frame 1 and a corresponding frame 2 for the blanket, said frames being hinged together at one side as indicated at 3 in the

drawings, and being provided with means such as clamps 4, 4, at the front of the frames for holding the two frames together. Means such as a vacuum pump 5 driven in the present instance by an electric motor 6 is provided for extracting the air from the space confined between the two frames 1 and 2 when the latter are secured together, the pump 5 being connected by means of suitable ducts 7, 7, with the interior of the frame, a pressure gage 8 being also provided to indicate the extent of the vacuum in the frame.

In the present instance, the frames 1 and 2 have at each side a projection 9, the projections of one frame lying adjacent those of the other and constituting together trunnions by means of which the entire frame is supported between the uprights 10, 10, of a supporting structure, which structure comprises in addition to the said uprights a base frame 11 to which said uprights are secured. The base frame 11 is preferably mounted upon casters or rollers 12, and is provided with side frames 13, 13, and a platform rest 14 for the pump 5 and the motor 6. As best shown in Fig. 5, the bearings for the respective trunnions 9 consist of brackets 9^a which, in the present instance, are secured to blocks 15 upon the respective uprights 10, 10.

In order to retain the frame 1—2 in the horizontal position, I provide locking means consisting of a bar 16 slidably mounted in a horizontal position upon the inside of the cross piece 17 at the top of one of the side frames 13. As best shown in Figs. 4 and 5, the bar 16 is held in place by means of a pair of brackets 18, 18, which latter are secured to the tops of the respective uprights 13^a, 13^a, of the said side frame 13, said brackets being such that the bar is freely slidable longitudinally therein. Upon each end of the bar 16 is a hook member 19 and 20 respectively, which members are adapted to engage suitable projections 21, 21, and 22, 22, upon the frames 1 and 2, the said hooks 19 and 20 being provided with recesses in their rear edges which the respective projections 21 and 22 are adapted to enter. It is apparent that with the bolts occupying the said recesses, the frame 1—2 will be held stationary in the horizontal position.

A spring 16^a having one end secured to the block 15 and the other to the bar 16 tends continually to retain the latter in the frame locking position, and there are provided at

each end of the bar 16 operating handles 34, 34^a, and 35, 35^a, respectively, by means of which the bar 16 may be shifted either to release or engage the said projections 21 and 22. The handles 34 and 35 are in the present instance integral parts of the brackets 18, 18, while the handles 34^a and 35^a are secured to the bar 16, and with this arrangement it is only necessary to grip and squeeze the handles of the respective pairs together to shift the bar 16 into unlocking position. The spring 16^a acts immediately upon release of the handles to return the bar to locking position.

To assist in elevating one or other of the frames 1 and 2, to the position illustrated in dotted lines in Fig. 1 whereby the work may be inserted in the frame, and in order further to maintain the frame in the elevated position until it is desired to shift it back, I provide, preferably at each side of the frame, a flexible element such as a cord or chain 26, one end of which is secured to the unhinged end of that one of the frames 1 or 2 which lies uppermost, and the other end of which passes around a spring-controlled pulley 27 at the top of the uprights 10. This spring-operated pulley has sufficient power to take up the cord 26 as the frame is elevated and to maintain the frame in the elevated position.

In order to facilitate the operation of turning the frame on its trunnions, I provide at the sides a pair of curved elements 28 whose curved ends, when the frames 1 and 2 are together, coincide in such manner as to form a substantially integral looped bar to which the said cord 26 is connected by means of a trolley-like device 29, including a roller 29^a which engages and travels upon the said elements 28, as best shown in Fig. 3. It will be apparent that when the frame is swung over from one horizontal position to the opposite in order to bring a particular one of the frames 1 and 2 to the top, the trolley element 29 will pass around the loop formed by the adjacent elements 28 and assume a position upon that one of said elements 28 connected with the frame which is being brought to the top. There is required, therefore, no adjustment of the cord 26, from one of the frames 1 and 2 to the other when their position is shifted, said cord automatically shifting from one of the elements 28 to the other as the frame is inverted. It will also be noted that the elements 26 with the associated parts automatically carry the frames 1—2 into the vertical position when the latter are released from the locking bar 16.

Means is also provided for preventing the elevation of one of the frames 1 and 2 unless the bar 16 is in the locking position, and for preventing withdrawal of the bar from said locking position after one of the

frames has been elevated and before it is returned to the horizontal. This safety lock consists in the present instance of an element 23 pivotally attached at 23^a to the opposite sides of the upright 10 overlying the bar 16. The element 23 comprises two arms 24 and 25 disposed at an angle, the arm 24 being curved rearwardly at the top and the arm 25 having at each side a rearwardly extending wing 25^a which lies against the opposite sides of the upright 10. A recess 30 is provided in the bottom of each of the wings 25^a into which, when the element is in the normal position, the top of the bar 16 extends. In the top of the bar 16 are a pair of spaced notches or recesses 31, 31, which are adapted to receive those portions of the wings 25^a lying immediately to the rear of the recesses 30 when the arm 25 of the element 23 assumes a forward position.

The arm 25 of the element 23 has in the present instance two slotted apertures 33, 33, through which extend screws 32, or the like, which fasten in the upright 10, these screws functioning to support coil springs 32^a, which tend to retain the arm 25 in the said forward position, and the heads of the screw limiting the said arm's forward movement.

As shown in Fig. 5, the trunnions 9, 9, normally bear against the arm 25 and retain it in retracted position against pressure of the springs 32^a. When, however, the topmost of the frames 1—2 is elevated, the arm 25 being released moves forward to the position shown in Fig. 8, in which it overlies the trunnion of the under frame and holds it fast in the bearings. Also the wings 25^a of the arm 25 in moving forward enter the aforesaid recesses 31, 31, in the bar 16 and prevent movement of the latter until the upper frame is returned to the horizontal. If by reason of failure of the springs 32^a the arm 25 is not advanced when the upper frame is elevated, the trunnion of the latter will engage the arm 24 of the element 23, and in forcing it rearwardly will advance the arm 25 into frame-and-bar-locking position. It will be apparent that unless the bar 16 is in locking position, the notches 31 will not register with the wings 25^a and the projection 9 cannot under these conditions pass the arm 24 which is held in an advanced position. When the elevated frame is returned to the horizontal, the projection 9 will again engage the arm 25, which is thus returned to the normal position in which the bar 16 is released.

In Figs. 10 and 11, are shown the brackets 9^a which constitute the bearings for the trunnions 9, 9. As clearly shown, these brackets are made in two parts 9^b and 9^c, which are held together by means of a bolt 37, this bolt also providing for adjustment

of the parts 9^b and 9^c to vary the space between these elements occupied by the trunnions. The projections 9, 9, which constitute the trunnions are so placed on the respective frames that they are slightly separated, and the portions 9^b and 9^c are so adjusted that when the frames 1 and 2 and their extensions 9 are in the horizontal position, as shown in Fig. 10, the said extensions fit neatly between the portions 9^b and 9^c. When the frames are shifted to the vertical position, the extensions 9 assume the position shown in Fig. 11, and by reason of the limited space between the portions 9^b and 9^c are pressed together, this having the effect of pressing the two frames 1 and 2 together when they are in the vertical or printing position. In this manner means is provided for applying pressure at the ends of the frames and replacing when the frame is in the perpendicular position, the force of gravity which operates when the frame is in the horizontal position to hold the frames together. By adjustment of the parts 9^b and 9^c of the brackets 9^a the extent of the pressure upon the trunnions may be varied.

The operation of the device will be apparent to those acquainted with the art. It is often desired to use these frames with the glass or blanket up, and the present invention provides a frame which may be used in either position. In practice, the upper frame, whichever it may be, is elevated, as previously described, the chain or cord 6 and its associated parts retaining it in the elevated position, as shown in broken lines in Fig. 1, during the time that the work is being placed in the frame. This frame is then lowered and clamped in position and the air drawn from the frame by means of the pump 5 whereby the metal plate and the negative are held tightly together, the frame thereafter being swung to the perpendicular or printing position. Where it is desired to reverse the position of the frame, it is merely necessary to shift the bar 16 to release the extensions 21 and 22, and thereafter to swing the entire frame on its trunnions 19, 19, to the reverse position, the cord 26 being automatically shifted into connection with the frame which has been moved into the upper position. That portion of the duct 7 which attaches to the frame is made flexible to permit turning the frame without re-adjustment of this element. The safety feature, in the element 23, renders the apparatus substantially fool-proof.

I claim:

1. In apparatus of the character described, the combination with a support, of a frame comprising separable glass and blanket-carrying sections pivotally mounted upon the support and adapted for reversal to bring either of said sections to the top, and means providing for elevation of the upper

end of said sections above the lower in both reverse and obverse positions of the frame.

2. In apparatus of the character described, the combination with a support, of a frame comprising separable glass and blanket-carrying sections adapted for adjustment on said support to bring either of said sections to the top, and means providing for elevation of the upper one of said sections above the lower in both reverse and obverse positions of the frame.

3. In apparatus of the character described, the combination with a support, of a frame comprising separable glass and blanket-carrying sections hinged together and adapted for adjustment on the support to bring either of said sections to the top, and means providing for the elevation of the upper one of said sections above the lower in both reverse and obverse positions of the frame.

4. In apparatus of the character described, the combination with a support, of a frame comprising separable glass and blanket-carrying sections hinged together and adapted for adjustment on the support to bring either of said sections to the top, and means for locking the lower of said sections in either position of the frame to said support.

5. In apparatus of the character described, the combination with a support, of a frame comprising separable glass and blanket-carrying sections adapted for adjustment on the support to bring either of said sections to the top, means for securing the lower of said sections in both reverse and obverse positions of the frame to the support, and means for supporting the upper one of said sections in a position elevated above the lower.

6. In apparatus of the character described, the combination with a support, of a frame comprising separable glass and blanket-carrying sections hinged together, means providing for the adjustment of said frame on the support to bring either of said sections to the top, means for securing the lower one of the sections in either position of the frame to the support whereby the upper one of the sections may be lifted on the hinges above the lower, and means for supporting the said upper section in an elevated position.

7. In apparatus of the character described, the combination with a support, of a frame comprising separable glass and blanket-carrying sections hinged together, means providing for the adjustment of said frame on the support to bring either of said sections to the top, means for securing the lower one of the sections in either position of the frame to the support whereby the upper one of the sections may be lifted on the hinges above the lower, and counter-

balance means for supporting the upper of said sections in an elevated position.

8. In apparatus of the character described, the combination with a support, of a frame comprising separable glass and blanket-carrying sections hinged together, means providing for the adjustment of said frame on the support to bring either of said sections to the top, means for securing the lower one of the sections in either position of the frame to the support whereby the upper one of the sections may be lifted on the hinges above the lower, counterbalance means for supporting the upper of said sections in an elevated position, and means for automatically shifting the connection between said counterbalance means from one section to the other during the adjustment of the frame on the support.

9. In apparatus of the character described, the combination with a support, of a frame comprising separable glass and blanket-carrying sections, and a pivotal connection between the said frame and the support providing for adjustment of the frame to bring either of said sections to the top and providing also for the elevation of the upper one of said sections in either position of the frame above the lower.

10. In apparatus of the character described, the combination with a support, of a frame comprising separable glass and blanket-carrying sections, projections from the opposite sides of one of said sections and projections from the opposite sides of the other of said sections adapted in conjunction with the respective projections of the said first section to constitute trunnions, and journals for said trunnions on the support whereby the frame is adapted for adjustment to bring either of said sections to the top, said split trunnions providing for the elevation of the upper one of said sections above the other in either position of the frame.

11. In apparatus of the type specified, the combination with a support, of a frame comprising separable elements pivotally mounted in said support and adapted for adjustment therein to bring either of said sections to the top, means for securing said elements together, and a member movable in the structure and adapted to engage the lower of said frame elements in both the said positions of the frame to retain the latter immovable on the support.

12. In apparatus of the type specified, the combination with a support, of a frame comprising separable elements mounted on the support and adapted for adjustment thereon to bring either of said sections to the top, means providing for the elevation of the upper one of said elements above the lower in both adjusted positions of the frame, means for locking the lower one of said elements to the support, and means operative when the upper of said elements is elevated for preventing release of said locking means.

13. In apparatus of the type specified, the combination with a support, of a frame comprising hinged elements and adapted for adjustment on the support to bring either of said elements to the top, means for locking said frame in the support in either of said adjusted positions whereby the upper one of said elements may be lifted on the hinges above the lower, and means automatically operative for preventing release of said locking means while the elements are separated.

14. In apparatus of the type specified, the combination with a support, of a frame comprising separable elements and adapted for adjustment in the support to bring either of said elements to the top, a locking element movable on the support and adapted to engage the lower one of the frame elements in both of said adjusted positions, and an element actuated by separation of the frame elements to engage the locking element to prevent release of the latter while the frame elements are separated.

15. In apparatus of the type specified, the combination with a support, of a frame comprising separable elements and adjustable on the support to bring either of said elements to the top, locking means for preventing movement of the frame on the support, and means for preventing separation of said frame elements while disengaged by said locking means.

16. In apparatus of the type specified, the combination with a support, of a frame reversible on the support, a movable member adapted to engage the frame to prevent movement thereof on the support, and resilient means tending to retain the member in locking position.

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