

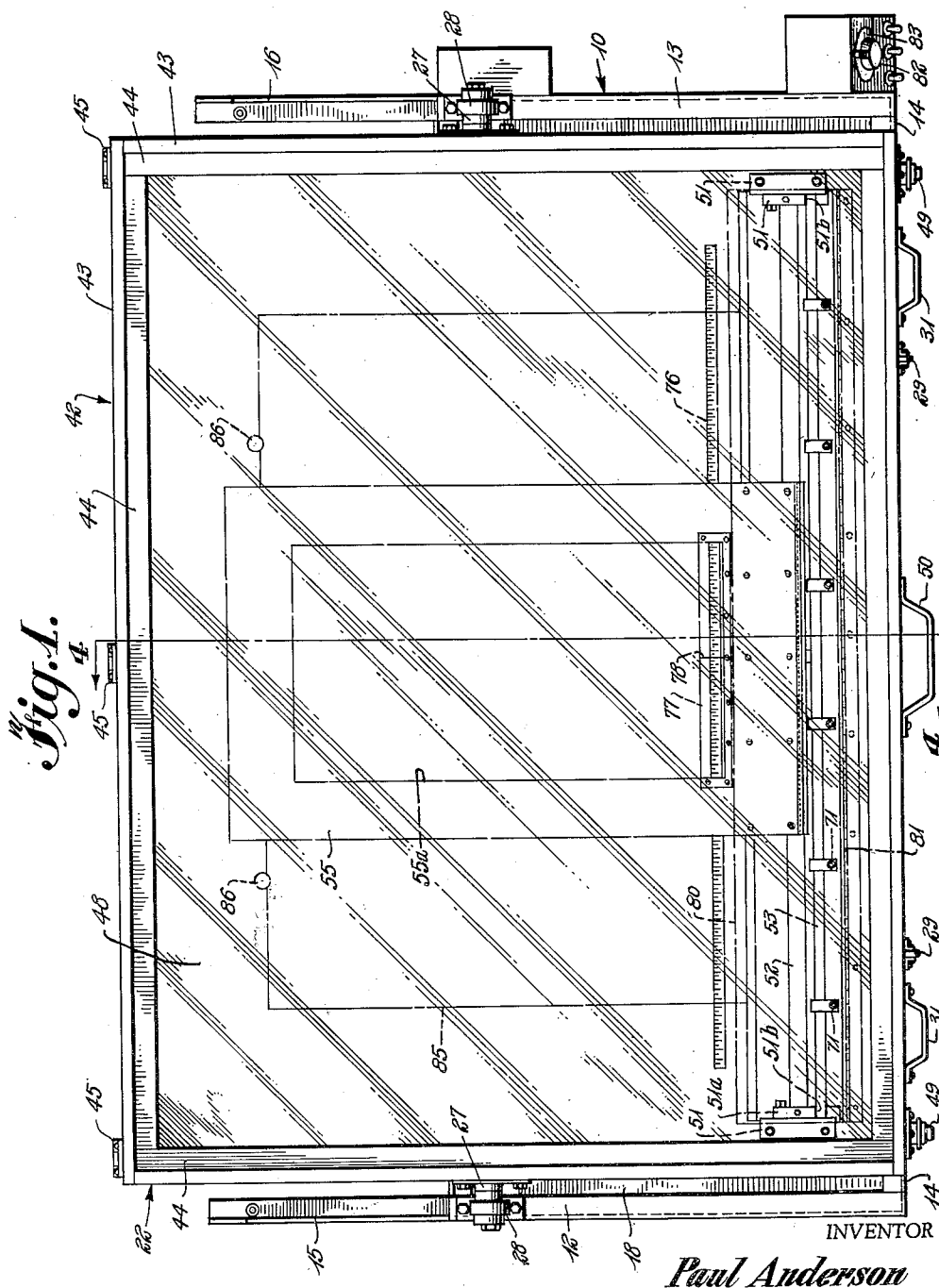
Feb. 26, 1952

P. ANDERSON
PHOTOCOMPOSING MACHINE

2,587,084

Filed March 21, 1951

5 Sheets-Sheet 1



BY *Burns, Doane + Benefield*
ATTORNEYS

Feb. 26, 1952

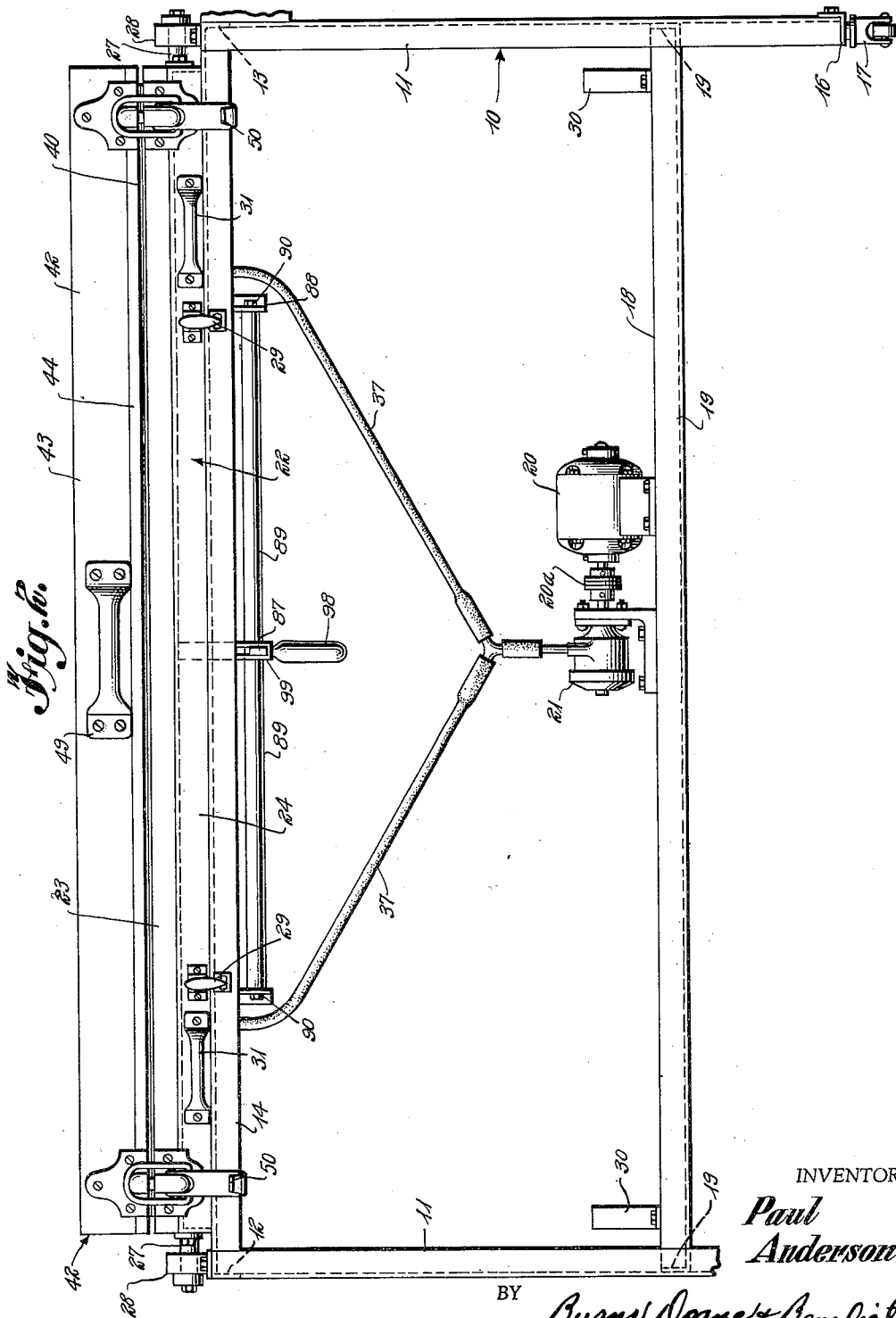
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5 Sheets-Sheet 2



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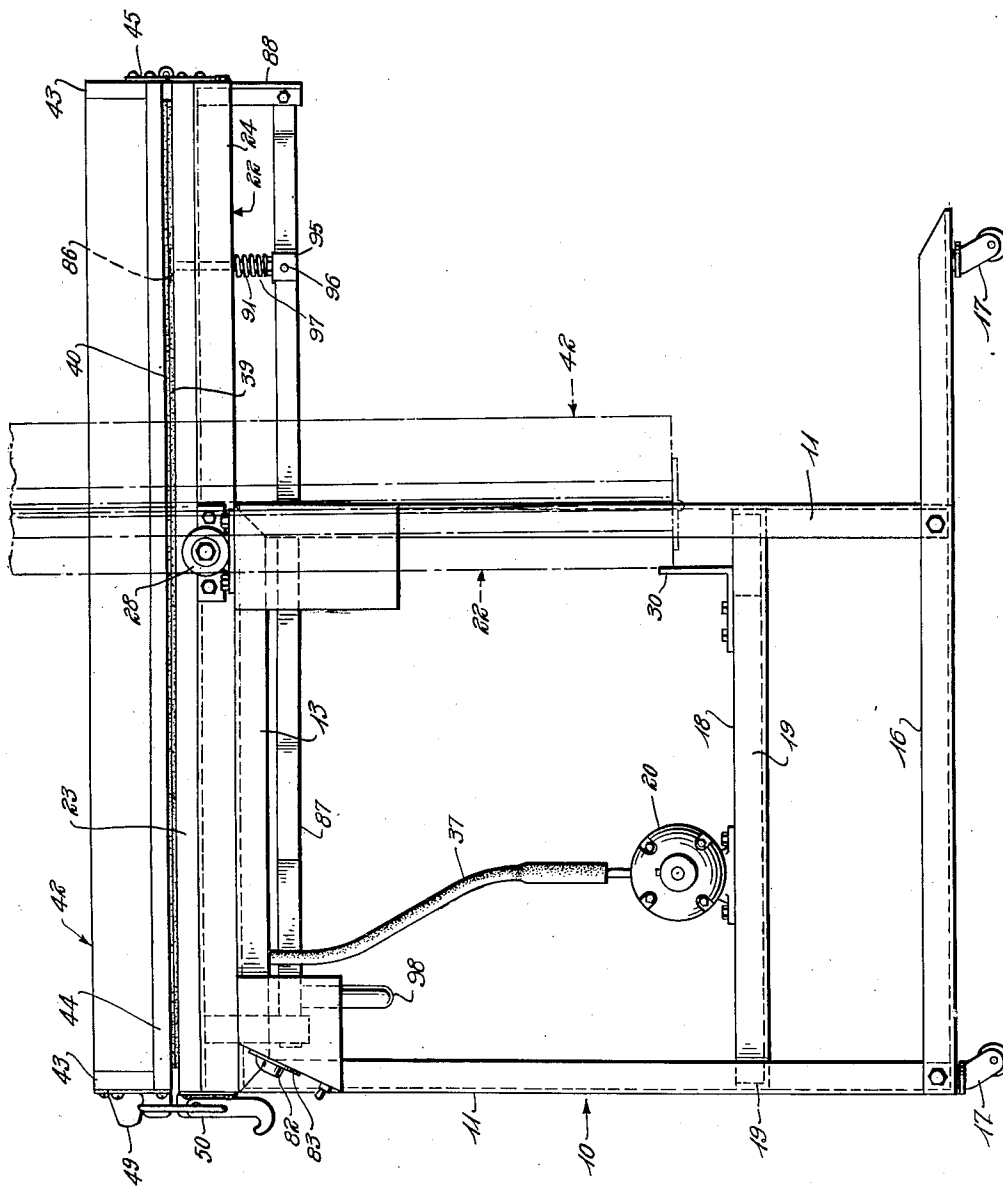


Fig. 3.

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5 Sheets-Sheet 4

Fig. 4.

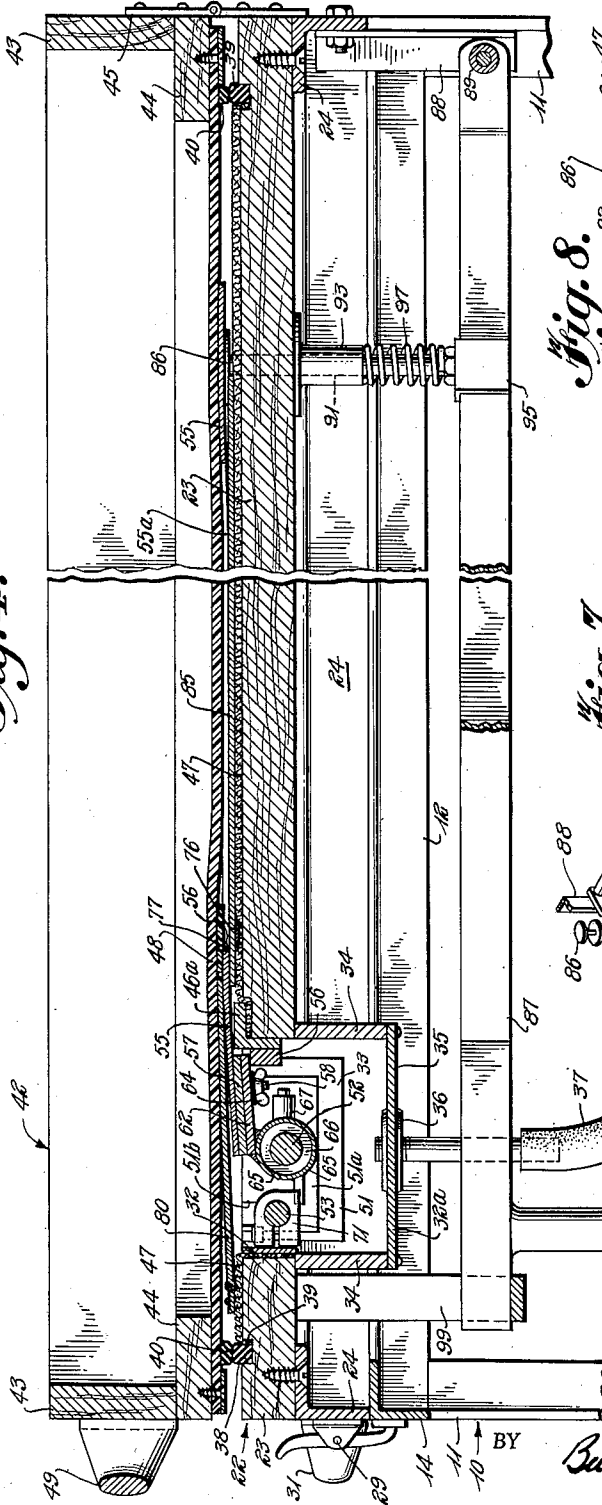


Fig. 8.

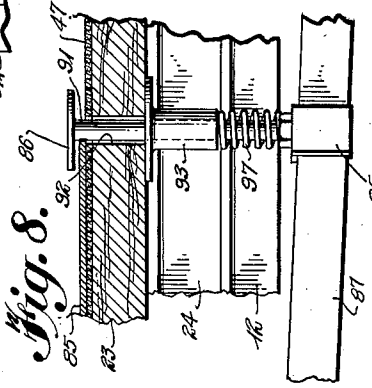
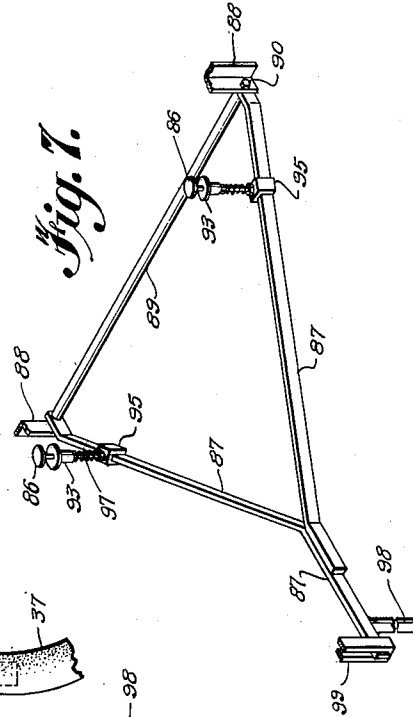


Fig. 7.



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5 Sheets-Sheet 5

Fig. 5.

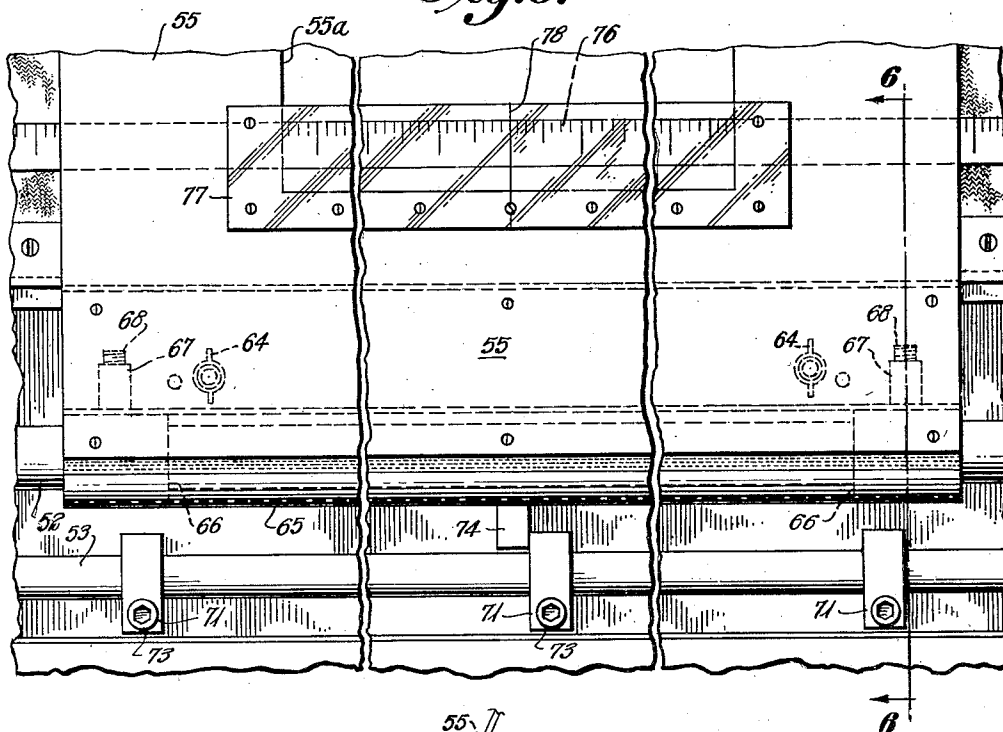
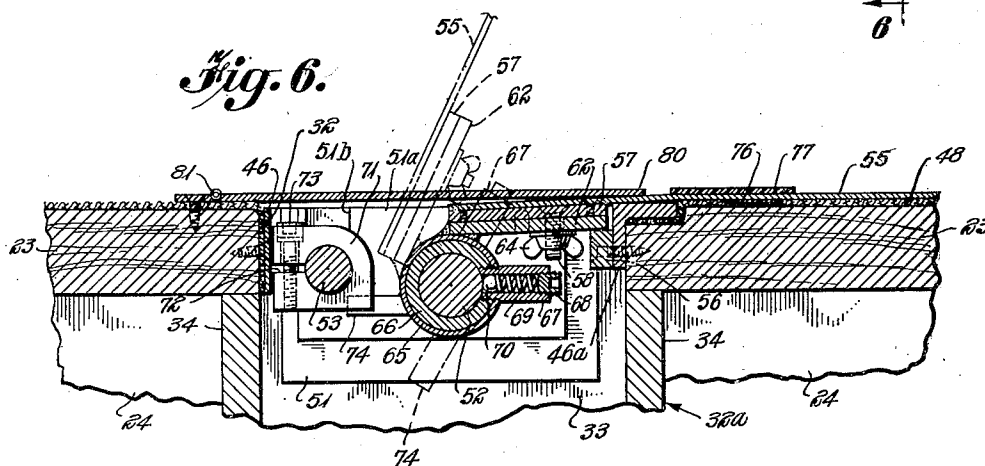


Fig. 6.



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2,587,084

PHOTOCOMPOSING MACHINE

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Application March 21, 1951, Serial No. 216,785

6 Claims. (Cl. 95-76)

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This invention relates to new and useful improvements in photocomposing machines.

In step and repeat printing, the original negative from a copying camera is used to print a number of duplicate images in accurately spaced relationship. Accurate spacing of the images is particularly important in those cases in which the images are to be transferred to a printing plate which is used to print multiple copies which are severed or trimmed apart after printing. Accurate positioning of the images is also imperative in color work wherein a series of plates are made (one for each color) from color transparencies. Each image on each plate must be spaced and located precisely with respect to its corresponding image on other plates so that there will be color registry of the colored prints produced with the plates.

Apparatus for properly and accurately positioning the images or prints is not broadly new. An object of my invention is to provide a simple machine for this purpose which requires little skill for its operation and which can be supplied to users at low cost because of its simplicity of operation and construction. A further object of the invention is to provide simple means for aligning and placing the negative in which the settings for determining the positions of the negative and the negative holder are easily made. A further object of my invention is to provide a machine for the purpose described which enables the settings to be made and the multiplicity of prints to be produced on the sensitized material in a minimum of time.

The foregoing and other objects and advantages of my invention are referred to in the following detailed description of an exemplary form of the invention. This detailed description has reference to the accompanying drawings, wherein:

Figure 1 is a top plan view of the apparatus with the cover plate over the stop mechanism shown in dot-dash lines for clarity;

Figure 2 is a front elevational view thereof;

Figure 3 is a side elevational view thereof showing the printing frame and its cover in horizontal position in full lines and in vertical position as indicated by dot-dash lines;

Figure 4 is a sectional view taken in the direction of the arrows along the line 4-4 of Figure 1;

Figure 5 is an enlarged fragmentary plan view of the negative holder carriage and stop mechanism;

Figure 6 is a fragmentary sectional view taken in the direction of the arrows along the line 6-6 of Figure 5;

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Figure 7 is a perspective view illustrating certain details of the plate clamping mechanism; and

Figure 8 is a fragmentary sectional view showing the plate clamp in its elevated or released position.

The supporting base is designated generally by the reference numeral 10 and includes vertical angle irons forming the four legs 11. The legs 11 are joined at their upper ends by side rails 12 and 13 and a front rail 14. Lower end rails 15 and 16 are secured to the lower ends of the legs 11 to stiffen the base. These lower end rails 15 and 16 extend rearwardly from the rearward legs 11 to provide a wider and more stable support. Casters 17 are secured to the extremities of the lower rails 15 and 16. A rectangular frame 19 has its corners secured to the legs 11. This rectangular frame functions to support a shelf 18, as well as to add stiffness or rigidity to the base 10. The shelf 18 supports an electric motor 20 which is connected to a vacuum pump 21 by means of a flexible shaft coupling 20a.

The printing frame is generally designated by the reference numeral 22. This printing frame has a rectangular baseboard 23 which has angle irons 24 secured along the edges of its lower surface. The angle irons 24 are secured at their ends and they form a rigid sub-frame. Trunnions 27 are secured to and extend outwardly from the end members 24 of the sub-frame. These trunnions are supported in bearing blocks 28 which are bolted to the members 12 and 13 of the base. Spring clamps 29 of any suitable construction are secured to the front angle iron 24 of the sub-frame, and are used to clamp or retain the printing frame 22 in the horizontal position shown by full lines in Figures 2 and 3. Release of the clamp 29 permits the printing frame 22 to pivot about the trunnions 27 and bearing blocks 28 from the full line position shown in Figure 3 to the dot-dash line position shown in that figure. Bumpers 30 secured to the rectangular frame 19 limit the extent of movement and provide stops when the printing frame is in the vertical position. Handles 31 provide convenient means for tilting the printing frame.

A rectangular opening 32 extends longitudinally for almost the entire length of the baseboard 23 near the front edge thereof. A trough or well 32a is formed beneath this opening by means of end members 33, side members 34 and a bottom member 35. The bottom member 35 of the trough is provided with a pair of flanged outlet couplings 36 to which are connected flexible tubes 37 which lead to the vacuum pump 21.

A printing frame cover 42 is formed from side and end members 43 and 44, as best illustrated in Figures 1 and 4. This cover is secured to the baseboard 23 by means of hinges 45. The printing frame cover is provided with a sheet of transparent plastic material 48 which is secured to the under surface of the cover members 44 by any suitable means. The transparent flexible sheet 48 is impervious to air but it permits transmission of light and it serves to maintain intimate contact between a negative and the sensitized material in a manner described below.

The baseboard 23 is provided with a channel 38 on its upper surface near its edges, and a flexible sealing element 39 is positioned in this channel. A similar flexible sealing element 40 is secured to the lower surface of the plastic sheet 48 in position to cooperate with the sealing element 39, to provide a seal entirely around the periphery of the baseboard 23.

The upper surface of the baseboard 23 is covered with soft cloth or felt material 47. This material is secured around the edges of aperture 32 by metal strips 46 and 46a.

The printing frame cover 42 is provided with a lifting handle 49 and with latches 50 of known construction which serve to maintain the cover in closed position with the sealing elements 39 and 40 in intimate contact.

A plate 51 is secured to the inner surface of each end member 33 of the trough or well 32a. Each plate 51 carries a sub-plate 51a which support the ends of shafts 52 and 53. The shafts 52 and 53 are parallel and are positioned within the well 32a. The shaft 52 may be fixed to the sub-plates 51a, but the shaft 53 may be entirely removed from the apparatus by lifting its ends upwardly through the slots 51b in the sub-plates 51a.

The negative holder 55 is a rectangular sheet of thin metal such as aluminum, and is provided with an aperture 55a which is rectangular. This aperture 55a is of sufficient length to substantially span the width of a sensitized plate 85 described below. A bar or plate 57 is secured to the under surface of the negative holder 55 along its forward edge. This bar or plate 57 is removably attached to a similar bar or plate 62 by means of bolts 58 having wing nuts 64. The rearward edge of the bar or plate 62 is slidably supported by the upper surface of a rail 56, as best illustrated in Figures 4 and 6. The forward edge of the bar or rail 62 is welded or otherwise secured to the exterior of a cylindrical tube 65. The cylindrical tube 65 is provided with bearing material 66 interposed between the inner surface of the cylinder and the outer surface of the shaft 52. In this manner the cylindrical member 65 is freely slidable along the shaft 52. I prefer to provide means for eliminating looseness or play between the cylindrical member 65 and the shaft 52 and I have illustrated a pair of tubular members 67 which extend radially from the cylindrical member 65. These tubular members 67 are closed at their outer ends by means of threaded plugs 68. The threaded plugs bear against compression springs 69 which serve to press balls 70 against the surface of the shaft 52, to eliminate play and to compensate for wear.

The cylindrical member 65 has a lug 74 welded or otherwise secured thereto. The cylindrical member 65 and the elements carried thereby may be designated as the negative holder carriage. It will be apparent from the foregoing description that the negative holder may be detachably

secured to the negative holder carriage, and that the negative holder will then be guided in its movement longitudinally of the machine.

The shaft 53 is provided with a plurality of stop members 71 which can be adjustably positioned along the length of the shaft 53. As illustrated, these stop members 71 are provided with circular openings for receiving the shaft 53. Those circular openings are slotted at 72 so that the stop members may be clamped to the shaft 53 by means of screws 73. The shaft 53 and the stop members 71 associated therewith are prevented from rotating by the proximity of the securing member 46 to the stop members. The purpose of the stop members 71 is to cooperate with the lug 74 on the negative holder carriage to enable the negative holder to be positioned in predetermined positions. The negative holder and the negative holder carriage may be pivoted about the shaft 52 from the position shown in the full lines in Figure 6 to the position shown in dot-dash lines in that figure. It will be seen that in the latter position the lug 74 clears the stop members 71 to permit longitudinal movement of the negative holder carriage along the shaft 52.

A graduated steel tape 76 is secured over the cloth 47 on baseboard 23 and extends parallel to the direction of travel of the negative holder, that is parallel to the shaft 52. The steel tape 76 is preferably graduated from zero outwardly in each direction from the center of the machine. The negative holder 55 has secured thereto a transparent plastic window 77 positioned to overlie the steel tape 76. The window 77 bears a reference line 78 at the exact center (longitudinally of the machine) of the aperture 55a in the negative holder 55.

A lid 80 is provided for the trough or well 32a to provide a supporting surface for the transparent sheet 48 and to prevent atmospheric pressure from pressing that sheet into the trough or well. This lid 80 is hinged at 81 to the upper surface of the baseboard 23.

A lithographic or other sensitized plate 85 may be positioned over the upper surface of the cloth 47 and centered on the machine with the aid of the scale 76. One edge of the sensitized plate may be clamped by means of clamping heads 86. The clamping heads 86 are controlled by means of a Y-shaped member 87 having its bifurcated ends pivoted to supports 88 by means of a long bolt 89 provided with nuts 90 at each end thereof. The clamping heads 86 are provided with stems 91 which extend through apertures 92 in the baseboard 23 and through sleeves 93 secured to the under surface of the baseboard. The lower ends of the stems 91 are provided with inverted U-shaped members 95 which fit over the legs of the Y-shaped member 87. Compression springs 97 surround the stems 91 between the sleeves 93 and the U-shaped members 95 and tend to force the clamping heads downwardly into plate clamping position. The Y-shaped member 87 is provided near the forward end of the machine with a handle 98 by means of which the Y-shaped member can be lifted to raise the clamping heads 86 to release the plate clamped thereby. The forward end of the Y-shaped member is preferably guided in its vertical movement by a guide 99.

The apparatus is preferably provided with a timing switch 82 having a dial 83 calibrated in seconds. This timing switch is used to control the light source which is used with the machine but which forms no part of the present invention.

The negative holder may be detached from the negative holder carriage and placed on a conventional light table where it can be properly oriented for placing the negative in the desired position. The negative is preferably taped to the under surface of the negative holder. The negative holder is then replaced on the negative holder carriage to overlie the sensitized plate 85. The stops 71 are appropriately adjusted along the length of the shaft 53 according to the desired spacing of the prints to be made on the sensitized plate. The lid 80 is closed after the lug 74 has been placed against one of the stop members 71. The printing frame cover 42 is then closed and latched by means of the latches 50. It is desirable to cover the sensitized plate 85 with mask paper except for the portions of that plate which are to be exposed. The printing frame is evacuated by means of the vacuum pump 21 and atmospheric pressure causes the plastic sheet 48 to press against the negative and negative holder to insure intimate contact between the negative and the plate 85.

The plate 85 is then exposed through the negative to the appropriate light, the nature of the light of course depending on factors which are well understood in this art. Exposure may be made in the horizontal position of the apparatus shown in full lines in Figure 3 or in the vertical position of the apparatus shown in dot-dash lines in that figure. The foregoing procedure may be repeated for each desired position of the negative.

The fact that the shaft 53 with its associated stops 71 is removable is of considerable advantage because it permits any particular setting of the stops to be saved so that work can be exactly duplicated, if necessary, at some future date. I contemplate that each machine will be provided with a number of shafts 53 so that such a shaft with its associated stops in proper adjustment can be stored indefinitely.

I have illustrated and described what I now consider to be the preferred form of my invention. It will be understood, however, that various modifications and equivalents may be resorted to without departing from the broader scope of the invention as defined by the following claims.

What I claim is:

1. A photocomposing machine comprising a printing frame having a baseboard, an aperture in said baseboard, a trough below said aperture, a first shaft within said trough, a negative holder carriage slidably mounted on said first shaft, a negative holder detachably secured to said carriage in position to overlie said baseboard, a second shaft removably positioned in said trough in parallel relation to said first shaft, a plurality of stop members adjustable along the length of said second shaft, means on said carriage for cooperating with said stop members for positioning said carriage and said negative holder relative to said baseboard, a lid for covering said aperture, said printing frame having a printing frame cover including a sheet of transparent flexible material for covering said baseboard, means for sealing the edges of said transparent sheet to said baseboard, and means for reducing the air pressure within said trough and between said baseboard and said transparent sheet.

2. In a photocomposing machine; a base; a printing frame secured to said base for pivotal movement from a horizontal position to a vertical position; means for clamping a sensitized

plate to said printing frame; a trough extending longitudinally of said machine; a first shaft within said trough and extending longitudinally of said machine; a negative holder carriage slidably mounted on said first shaft; a negative holder detachably secured to said carriage in position to overlie a sensitized plate clamped to said printing frame; a second shaft removably positioned in said trough parallel to said first shaft; a plurality of stop members adjustable along said second shaft; means carried by said carriage for positioning said negative holder according to the positions of said stop members; a printing frame cover for said printing frame, said printing frame cover including a transparent flexible sheet of air impervious material for substantially covering said printing frame; sealing means between said printing frame and said printing frame cover; means for reducing air pressure between said printing frame and said cover; and a movable lid for said trough to prevent said transparent flexible sheet from being forced into said trough.

3. A photocomposing machine printing frame comprising a baseboard, an aperture in said baseboard, a trough below said aperture, a negative holder carriage, means for slidably mounting said carriage within said trough, a printing frame cover having a sheet of transparent flexible material for covering said baseboard and said aperture, a negative holder secured to said carriage and positioned between said baseboard and transparent sheet, and means for reducing the air pressure within said trough and between said transparent sheet and said baseboard.

4. A photocomposing machine printing frame as described in claim 3, having a lid for said aperture to prevent said transparent flexible sheet from being forced through said aperture into said trough by atmospheric pressure.

5. A photocomposing machine printing frame as described in claim 3, in which said printing frame is provided with a supporting base and the printing frame is pivotally mounted on the base to permit movement of said baseboard from a horizontal plane to a vertical plane.

6. In a photocomposing machine; a base; a printing frame secured to said base for pivotal movement from a horizontal position to a vertical position; means for clamping a sensitized plate to said printing frame; a trough extending longitudinally of said machine; a first shaft within said trough and extending longitudinally of said machine; a negative holder carriage slidably mounted on first shaft; a negative holder detachably secured to said carriage in position to overlie a sensitized plate clamped to said printing frame; a second shaft removably positioned in said trough parallel to said first shaft; a plurality of stop members adjustable along said second shaft; means carried by said carriage for positioning said negative holder according to the positions of said stop members; a printing frame cover for said printing frame, said printing frame cover including a transparent flexible sheet of air impervious material for substantially covering said printing frame; sealing means between said printing frame and said printing frame cover; and means for reducing air pressure between said printing frame and said cover.

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No references cited.