Nov. 26, 1935. W. C. HUEBNER 2,021,959

COMPOSER PRINTING MACHINE

Filed May 2, 1934 4 Sheets-Sheet 1

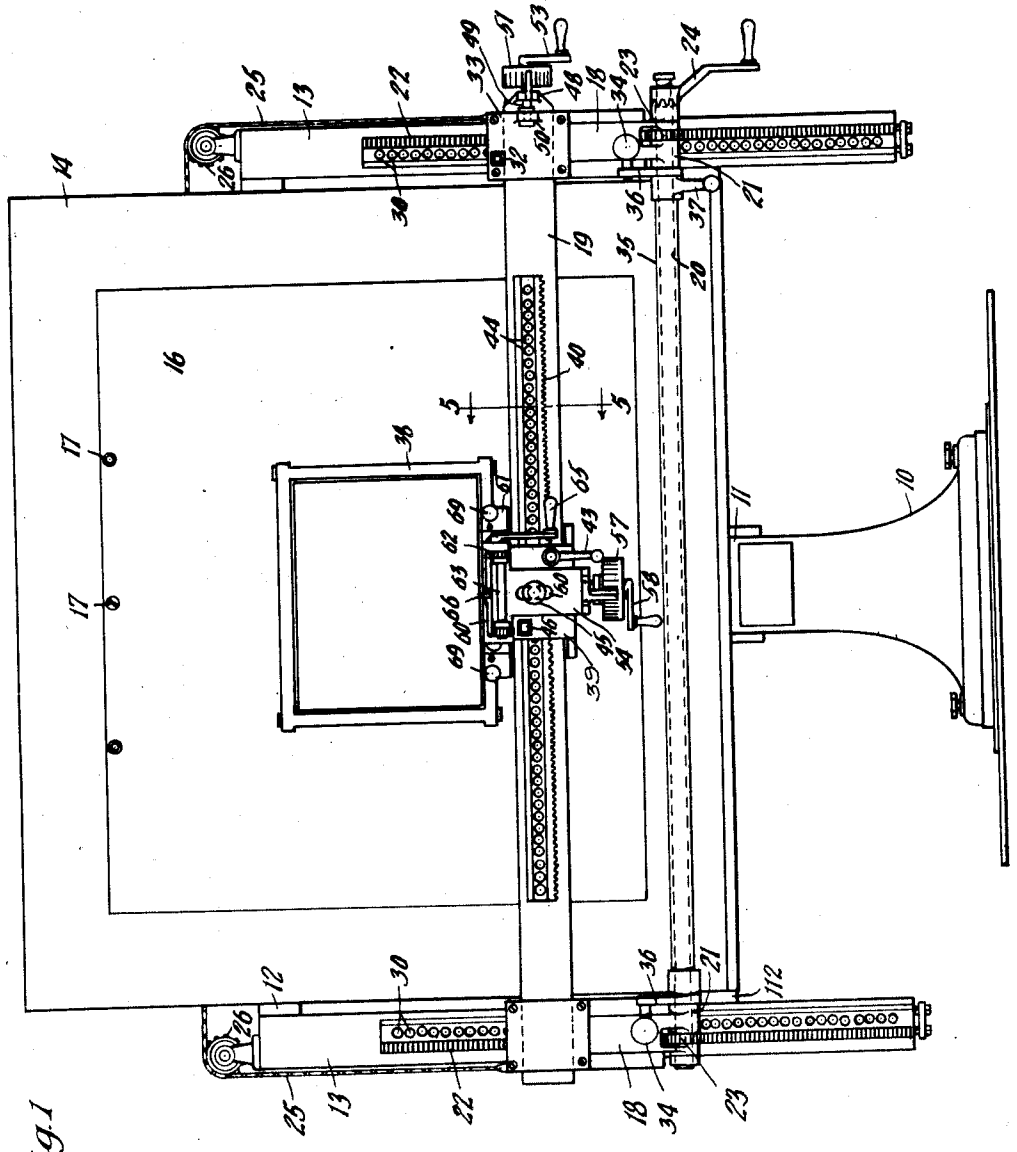

Fig. 1

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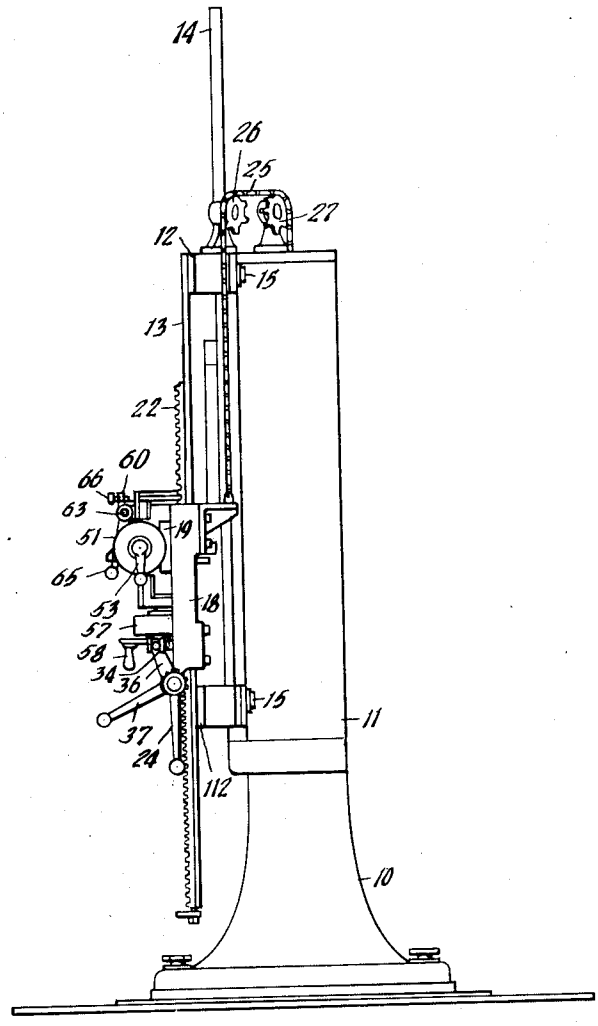
Fig. 2



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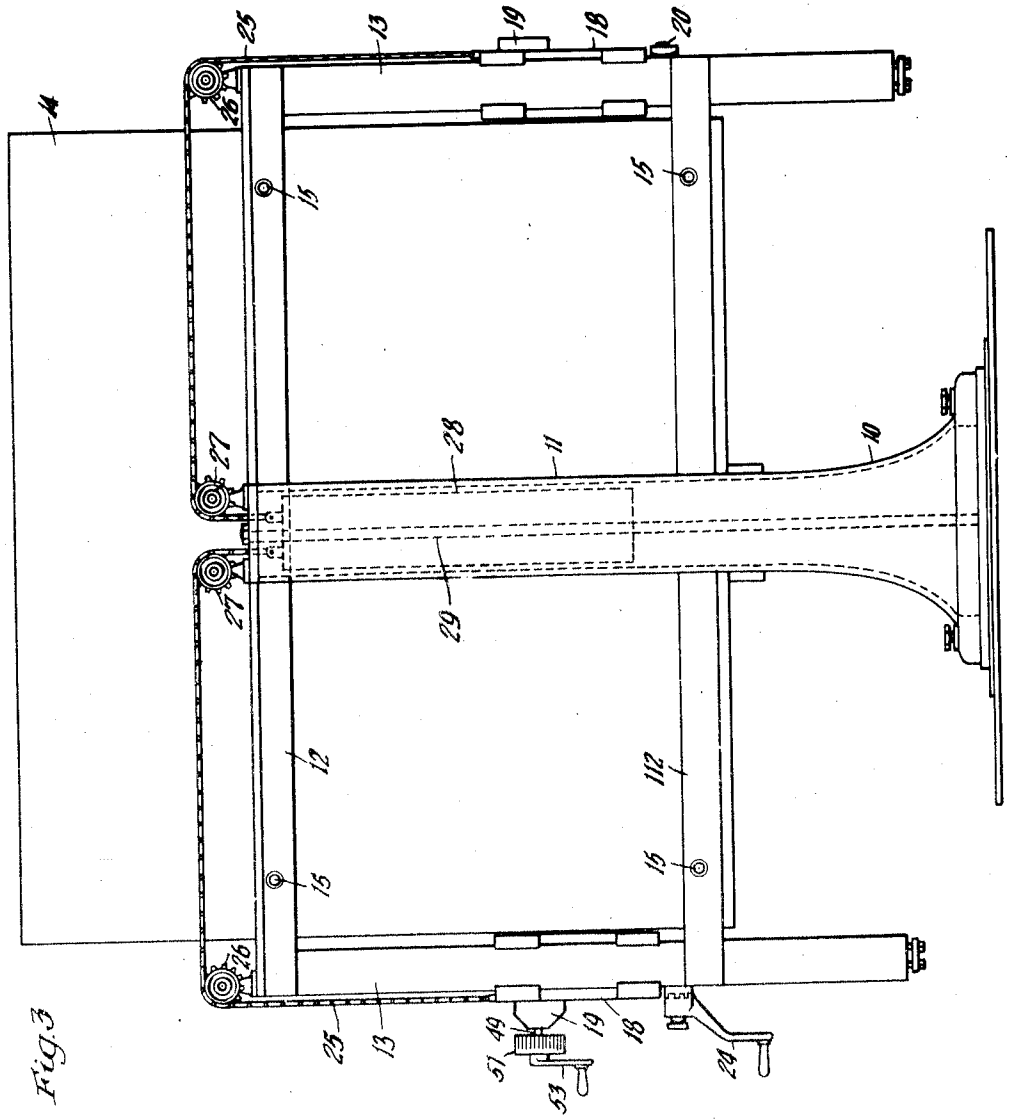

Fig. 3

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Fig.4

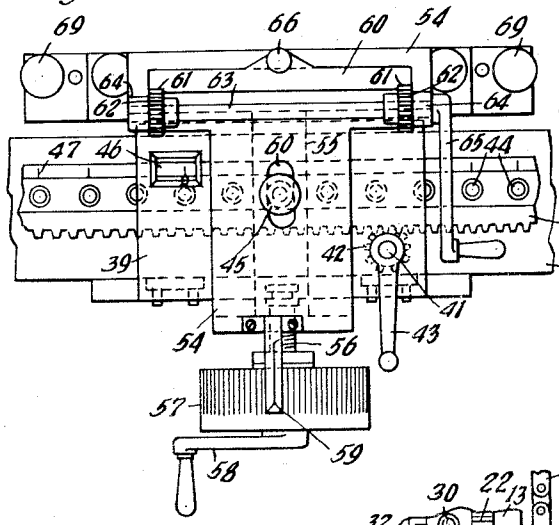


Fig.5

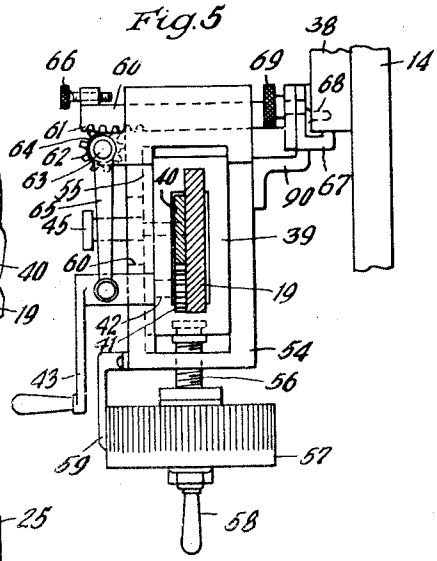


Fig.6

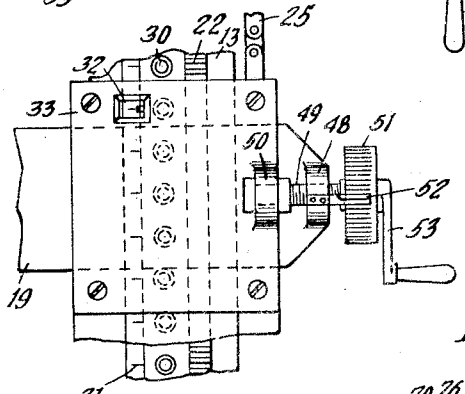


Fig.7

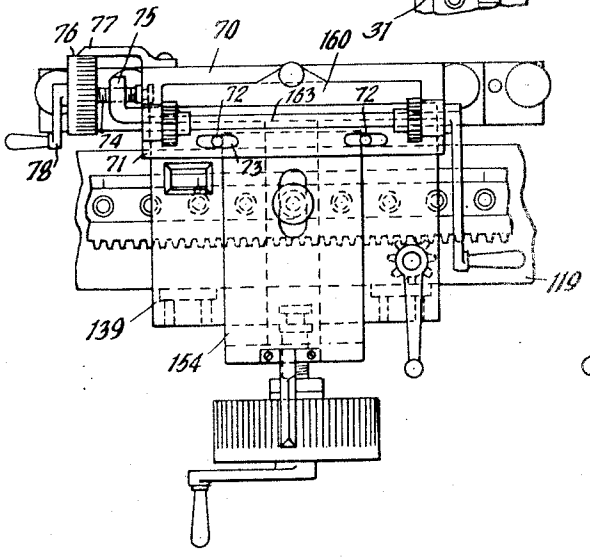
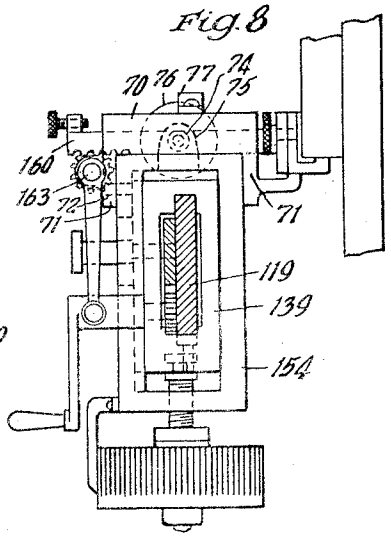


Fig.8



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Patented Nov. 26, 1935 2,021,959

UNITED STATES PATENT OFFICE

2,021,959

COMPOSER PRINTING MACHINE

William C. Huebner, New York, N. Y.

Application May 2, 1934, Serial No. 723,430

6 Claims. (Cl. 95—73)

This invention relates to improvements in composer printing machines and more particularly photographic printing machines commonly called photo-composers and is in the nature of an improvement upon that type of machine for a similar purpose disclosed in my prior Patent 1,923,671, granted August 22, 1933.

As described in said prior patent, photographic printing machines for the production of press plates and the like for use in printing presses, are generally designed so as to hold the press plate stationary and the printing element, such as a negative, is so mounted as to move in a plane parallel to the press plate in such manner that the printing element may be moved to any desired predetermined position over the surface of the press plate. In the machine of said patent, a main beam or supporting member is so mounted on the main frame as to be bodily movable vertically up and down thereon and in addition the beam is bodily movable horizontally with reference to the frame a sufficient amount to provide for all the necessary horizontal adjustment of the negative with reference to the press plate. Provision is made in the machine of said patent for an initial, relatively coarse horizontal adjustment of the beam, supplemented by a limited finer adjustment and similar provision is made for relatively coarse and fine adjustments of the beam vertically with reference to the main frame. One of the disadvantages of said prior patented construction resides in the fact that an unnecessary amount of space is required to accommodate the horizontal movements of the beam which must be of such length and have such allowable movement as to permit it to project to either side of the machine a distance corresponding to half the horizontal dimension of the press plate. It will further be observed that the said beam, because of the extended movement thereof, involves an unnecessary amount of material, thus increasing the initial cost as well as adding unnecessary weight to the machine.

One object of the present invention is to provide a machine of the character above referred to wherein the minimum amount of space is required to accommodate a machine of given size and all of the necessary movements of the parts thereof.

More specifically, an object of the invention is to provide a machine of the character indicated wherein a single beam, monorail or supporting member is mounted on the main frame for bodily movement in one direction and the negative holder supporting means are movable on the beam in a direction at right angles to the line of movement of the beam for all of the relatively coarse adjustments of the negative with reference to the press plate, supplemented by relatively fine adjusting means in two directions at right angles to each other but wherein the beam is limited to a very small movement with reference to the frame in a direction at right angles to its main bodily movements.

Another object of the invention is to reduce the number of parts necessary in effecting the several coarse and fine adjustments at right angles to each other of the carrying means for the negative holder so as to minimize the cost of material, finishing thereof, and simplify the operation of the machine.

Other objects of the invention will more clearly appear from the description and claims hereinafter following.

In the drawings forming a part of this specification, Figure 1 is a front elevational view of one embodiment of the invention. Figure 2 is an end elevational view of the machine shown in Figure 1. Figure 3 is a back elevational view of the machine shown in Figure 1. Figure 4 is a broken, enlarged front elevational view of a portion of the beam and negative holding and supporting means carried thereby. Figure 5 is a vertical section and elevational view corresponding approximately to the line 5—5 of Figure 1. Figure 6 is an enlarged, detail view illustrating more particularly the micrometer adjusting means of the beam. And Figures 7 and 8 are views corresponding respectively to Figures 4 and 5, illustrating a modified form of the improvements.

Referring first to the construction illustrated in Figures 1 to 6, the machine is shown as comprising a main frame consisting of a pedestal 10 from which extends an upright column 11; upper and lower cross bars 12 and 112 secured at their centers to the column 11; and vertically extending side guides or columns 13—13. The cross bars 12 and 112, in addition to providing the necessary connections and supports for the side columns 13 also constitute the supporting means for the press plate support, which preferably is in the form of a heavy slab of slate or equivalent 14 secured to said cross bars 12 and 112 by any suitable means such as the screws 15—15. The press plate indicated at 16 is mounted on the front face of the support 14 and may be secured to the latter in any suitable manner, as by the screws 17.

Vertically slidably mounted on each of the side columns 13 is a cross head or slide 18 suitably

keyed to the column so as to be confined to a straight line vertical up and down movement. The two cross heads 18 support the ends of the beam or monorail 19, the latter being slidable or horizontally adjustable in the cross heads 18 for a limited distance as hereinafter described. Another cross connection or tie between the two cross heads is obtained by means of the operating shaft 20 journaled at its ends in bearings 21—21 carried by the cross heads.

The cross heads 18 and associated parts carried thereby are adjusted up and down on the side guides or columns 13, preferably by means of vertical racks 22 mounted on the columns and cooperable pinions 23 carried by the shaft 20. The latter is adapted to be operated by a detachable clutch crank handle 24 at one end thereof. To facilitate the vertical movements of the cross heads, beam and other parts, the cross heads are connected by suitable sprocket chains 25—25 running over sprocket wheels 26—26 mounted at the tops of the columns 13, and sprocket wheels 27—27 mounted at the top of the center column 11, said sprocket chains being attached to a suitable counterweight 28, freely vertically movable within the center column 11 and preferably guided therein by a vertical bolt 29 extended through the counterweight.

On each of the side columns or guides 13 is provided a vertically arranged series of dowel holes or openings 30—30, accurately spaced apart at predetermined intervals, preferably one inch center to center and associated with the right hand series of dowel holes 30 will preferably be provided a scale, as indicated conventionally at 31 in Figure 6. The adjusted vertical position of the monorail with reference to the frame may be conveniently ascertained by means of a sight hole or opening 32, provided in the cover plate 33 of the right hand cross head, as shown in Figure 6. To positively retain the cross heads and beam 19 carried thereby in the desired vertical coarsely adjusted position determinable by the dowel holes 30, each of the cross heads carries a dowel pin 34 adjustable inwardly and outwardly of the cross heads. The latter are adapted to be operated simultaneously at both sides of the machine by means of a sleeve shaft 35, mounted on the shaft 20, and which shaft 35 carries crank arms 36—36 having pin and slot engagement, as best indicated in Figure 2, with the respective dowel pins. The sleeve shaft 35 may be actuated by the hand lever 37, as will be apparent. To provide for the necessary relatively coarse horizontal adjustments of the negative holder 38 with reference to the press plate 16, the following saddle or carriage arrangement for the negative holder is preferably employed, reference being had to Figures 4 and 5. Horizontally slidably mounted on the beam 19 is a preferably rectangular block or cross head 39 and which is confined to straight line horizontal movement on the beam, as will be apparent from Figures 4 and 5. Horizontal adjustment is preferably effected by means of a rack bar 40, secured to the front face of the beam 19 and a pinion 41 cooperable therewith carried by a shaft 42, journaled in the block 39, and adapted to be operated by the hand lever 43.

To insure the predetermined relatively coarse horizontal adjustments of the negative carriage arrangement on the beam, similar means are preferably employed as employed in the case of the cross heads 18, that is, the beam 19 is provided with a horizontal series of dowel holes or openings 44, spaced apart a predetermined distance, preferably one inch center to center and the block 39 carries a cooperable dowel pin 45 adapted to be directly manipulated by hand so as to be projected into and withdrawn from the dowel holes 44. The relatively coarse horizontal adjustments of the carriage arrangement may be determined by a sight hole or opening 46 in the block 39 and which registers with a horizontal indicator scale 47 on the beam.

To enable horizontal relatively fine adjustments of the negative holder carriage arrangement relative to the frame and press plate 16, for amounts less than the inch spacing of the dowel holes 44, the beam 19 is provided with a micrometer adjustment relative to the cross heads 18. Referring to Figure 6, this micrometer adjustment is preferably effected by means of a nut boss 48 on the end of the beam and with which cooperates a finely threaded screw 49 having a swivel connection at its inner end with a boss 50 on the cover plate 33. The outer end of the screw 49 preferably carries a dial 51 graduated to thousandths of an inch and readings of the adjusted position may be taken from the straight edge 52 secured to the boss 48 of the beam 19. The screw 49 may be conveniently rotated by means of the hand lever 53. By spacing the dowel holes on the beam an inch apart and forming the threads of the screw 49 with a predetermined pitch with corresponding spacings of the dial 51 so as to give readings of thousandths of an inch, it is evident that the horizontal adjustments of the negative holder may be made to any desired thousandths of an inch position while at the same time the movement of the beam horizontally with reference to the frame is limited to an inch or less, thus reducing the required space for the machine to the minimum for any given size.

To enable the negative holder 38 to be relatively finely adjusted between the inch spacings of the dowel holes 30, the following arrangement is preferably employed, again referring to Figures 4 and 5. Vertically slidably mounted on the block 39 is a rectangular yoke 54, the vertical movements of the latter being insured by means of a vertical key and slot formation 55 on the yoke and block 39. The central opening of the yoke 54 is vertically elongated so as to provide for a full inch vertical movement which is preferably effected by means of another micrometer screw 56, swiveled at its end in the block 39 and having threaded adjustment with the lower horizontal section of the yoke 54. Said screw 56 is provided with a dial drum 57 rotatable by means of the hand lever 58, readings being taken by means of the knife edge finger or arm 59 secured to the yoke 54. The latter, as shown in Figure 4, is provided with a vertically elongated slot 60 through which is extended the dowel pin 45 and by reason of which the relative vertical movements between the block 39 and yoke 54 are accommodated. By the arrangement described, it is evident that any desired vertical position of the negative holder 38 to thousandths of an inch may be obtained by first adjusting the beam 19 to the nearest full inch and locking the same through the dowel and pin arrangement 30—34 and the fractional part of the inch adjustment effected through the screw 56.

As will be apparent to those skilled in the art, the number of parts necessary to effect all of the adjustments in positioning the negative holder over the press plate is reduced to the minimum

since only one micrometer adjustment device is necessary for the beam and one only for the negative holder.

In the operation of machines of the character disclosed, it is essential that the negative be in intimate contact with the press plate during the time of exposure and also that it is necessary to effect clearance between the negative and press plate when making any shift or adjustment, so as to avoid injury to either the negative or sensitized plate. To allow of this clearance movement, the yoke 54 (see Figures 4 and 5) carries a horizontally adjustable slide 60 at the top thereof, which is movable inwardly and outwardly toward and from the press plate by means of racks 61 and cooperable pinions 62 carried by a shaft 63 journaled in suitable bearings 64 integral or rigid with the yoke 54. The shaft 63 is operated by hand lever 65 at one end thereof. Preferably, the slide 60 carries an adjustable stop or limiting screw 66 engageable with a portion of the yoke 54 to prevent movement of the slide too far inwardly of the press plate. At its inner end, the slide 60 is provided with a supporting bar 67 on which the negative holder 38 is supported and to which it is attached in predetermined position by means of suitable cooperable dowel pin and dowel openings 68 on the negative holder and supporting bar 67. The dowel pin arrangement constitutes the registering means for the negative holder as well understood in the art, and in order to retain the negative holder in place, suitable thumb screws 69 may be employed, the same being carried by the bar 67 and adapted to be threaded into corresponding holes of the negative holder so as to prevent the latter from accidentally becoming displaced or from falling off. The bar 67 is horizontally slidably supported on a bracket 90 secured to the inner wall of the yoke 54.

Referring to the modification shown in Figures 7 and 8, the arrangement there shown provides for the horizontal micrometer adjustment of the negative holder with reference to the press plate and frame by means on the carriage arrangement, which means may be either in lieu of the micrometer beam adjustment or supplemental or auxiliary thereto. The block 139, yoke 154 and relative vertical adjusting means therefor are the same as in the previously described form. On the top of the yoke 154 is mounted a sub-carriage 70 adapted to slide horizontally back and forth on the yoke in a direction parallel to the beam 119, this being accomplished by means of depending side arms 71—71 which snugly engage the front and rear walls of the yoke 154. The horizontal adjustment referred to is limited preferably by means of a pin and slot arrangement 72 and 73, as shown in Figure 7, and the micrometer adjustments are effected by means of the micrometer screw 74 swivelly attached at its end to the sub-carriage 70 and threaded through a bracket arm 75, carried by the yoke 154. Said screw 74 is provided with a similar indicator dial 76 with cooperable reading finger 77 and the screw is adapted to be operated by the hand lever 78. In this instance, the slide 160 to which the negative holder is attached, is mounted in the sub-carriage 70 and the pinion shaft 163 for moving the slide in and out is journaled in bearing brackets carried by the sub-carriage 70 instead of by the yoke as in the first described form. As will be evident, the horizontal, relatively coarse inch adjustments of the negative holder and carriage therefor is effected in the same manner as previously described and the micrometer horizontal adjustments effected through the micrometer screw 74. With this arrangement, the beam micrometer adjustment 49—50, etc. may be omitted.

Although there has herein been shown and described what is now considered the preferred manner of carrying out the invention, the same is merely illustrative and all changes and modifications are contemplated that come within the scope of the claims appended hereto.

What is claimed is:

1. In a machine of the character described, a frame having means for supporting a print-receiving element in position thereon; a single supporting member bodily adjustable on said frame back and forth in a line for a distance corresponding approximately to one dimension of the print-receiving element; a carrier for a print-producing element bodily movable on said supporting member back and forth in a line at an angle to said line of movement of the supporting member and for a distance approximating the other dimension of the print-receiving element; means for locking said supporting member relative to the frame in relatively coarsely spaced predetermined positions; means for locking said carrier relative to the supporting member in relatively coarsely spaced predetermined positions thereon; and supplemental sets of means for relatively finely adjusting, each within a limited distance only, the supporting member relative to the frame in a line parallel to the line of adjustment of the carrier on the supporting member while the carrier is locked thereto and the carrier relative to the supporting member in a direction parallel to said bodily line of adjustment of the supporting member relative to the frame while the supporting member is locked to the frame.

2. In a machine of the character described, a vertically disposed frame; a beam adjustable vertically on said frame; means for retaining said beam in adjusted vertical position relative to the frame; means for relatively finely adjusting the beam horizontally relative to the frame for a limited distance only; a carrier for a print-producing element bodily movable horizontally back and forth on the beam; and means for relatively finely adjusting said carrier vertically with reference to the beam while the latter is retained in vertically adjusted position on the frame.

3. In a machine of the character described, the combination with a supporting frame having associated therewith means for supporting a print-receiving element in operative position; cross heads slidably supported on said frame; a supporting member carried by said cross heads and bodily movable in unison therewith relative to the frame; means for simultaneously adjusting the cross heads on the frame; means for locking said cross heads to the frame in adjusted position; means for adjusting the supporting member for a limited distance only relative to the cross heads while the latter are locked to the frame, and in a direction at right angles to the movement of the cross heads on the frame; a carrier for a print-producing element; means for adjusting said carrier back and forth on said supporting member in one direction; and additional means for adjusting said carrier relative to the supporting member for a limited distance only in a direction at right angles to said first named movement of the carrier on the supporting member and while the cross heads are locked to the frame.

4. In a machine of the character described, the combination with a supporting frame and having associated therewith means for retaining a print-receiving element in operative position; a pair of cross heads slidably mounted on said frame to move in a plane parallel to that of the print-receiving element; means for locking the cross heads to the frame in adjusted position; a beam carried by said cross heads and movable in unison therewith; means for adjusting the beam relative to the cross heads a limited distance only in a direction at right angles to the movement of the cross heads; a carrier for a print-producing element mounted on said beam; means for relatively coarsely adjusting said carrier on said beam in a direction parallel to the line of adjustment of the beam relative to the cross heads; and means for relatively finely adjusting, for a limited distance only, said carrier relative to the beam while the cross heads are locked to the frame, in a direction at right angles to its first named line of adjustment thereon and in a plane parallel to that of the print-receiving element.

5. In a machine of the character described, the combination with a supporting frame having associated therewith means for retaining a print-receiving element in operative position; of a single beam adjustable on said frame parallel to the print-receiving element; a carrier adjustable on the beam at right angles to the line of adjustment of the beam and in a plane parallel to that of the print-receiving element; and a single set of means for relatively finely adjusting the carrier on the beam in a direction at right angles to the latter and in a plane parallel to that of the print-receiving element.

6. In a machine of the character described a frame having a pair of vertically disposed guides thereon; a pair of cross heads vertically slidably mounted on said guides; cooperable means on said cross heads and guides, simultaneously operable, for locking said cross heads in vertically adjusted position at predetermined unit intervals of spacing; a horizontally disposed beam supported at its ends in said cross heads and vertically adjustable therewith and adapted to be held in vertically adjusted position when the cross heads are locked; a block horizontally slidably mounted on said beam; cooperable means on said beam and block for locking the block in horizontally adjusted positions at predetermined similar unit intervals of spacing; a single set of cooperable means at one end of the beam and adjacent cross head for adjusting the beam horizontally relatively to the cross heads predetermined fractional parts of and to a maximum of one unit interval of spacing; a negative holding element vertically slidably mounted and guided on said block; and a single cooperable set of means on said block and element for vertically adjusting the negative holding element, while the beam cross heads are locked and the block locked to the beam, predetermined fractional portions of and to a maximum unit interval of said spacing.

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