Aug. 4, 1936. E. E. COOPER ET AL 2,049,557

PHOTO COMPOSING MACHINE

Filed Feb. 12, 1935 2 Sheets-Sheet 1

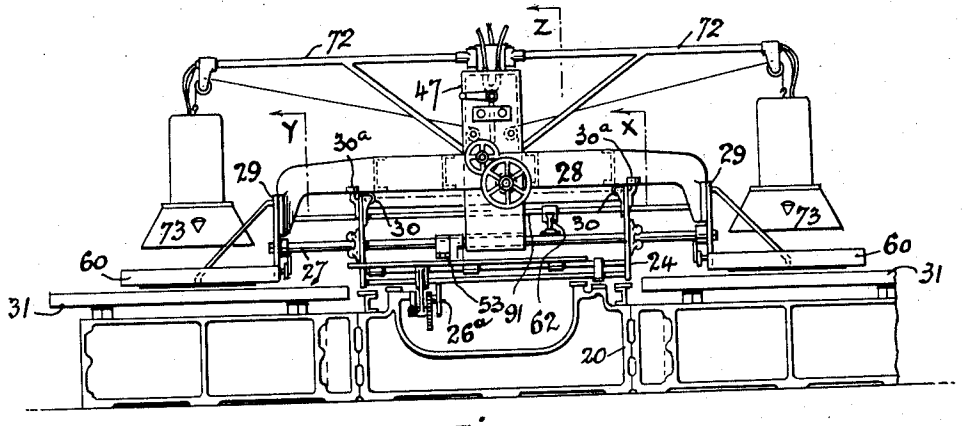


Fig. 1

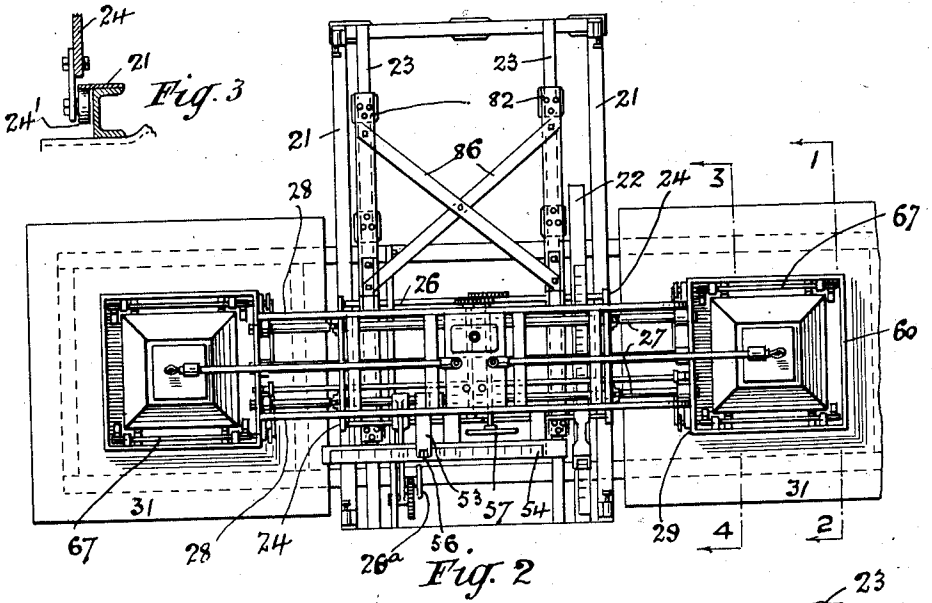


Fig. 3

Fig. 2

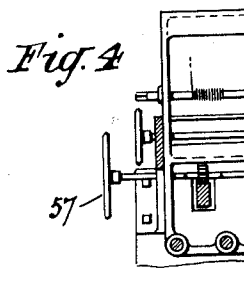


Fig. 4

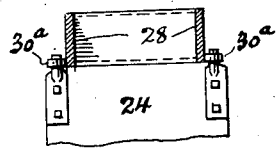


Fig. 5

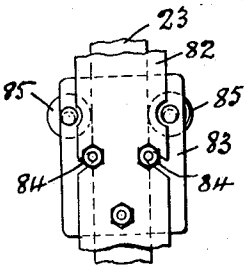


Fig. 6

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PHOTO COMPOSING MACHINE

Filed Feb. 12, 1935 2 Sheets-Sheet 2

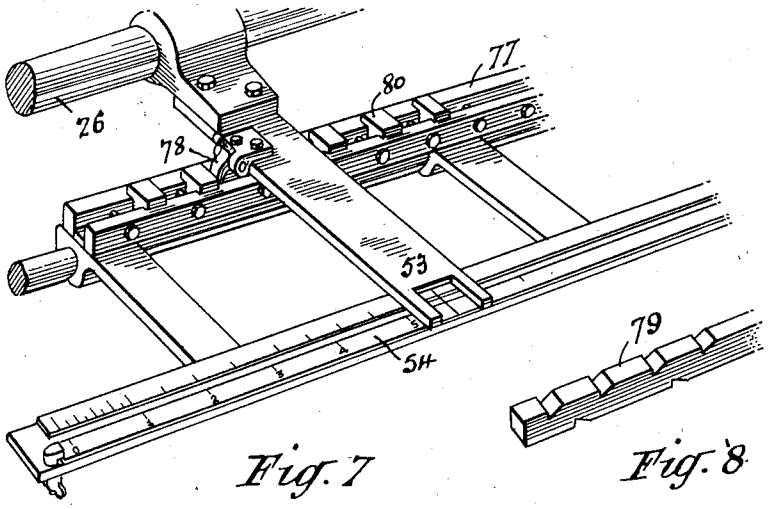


Fig. 7

Fig. 8

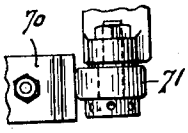


Fig. 12

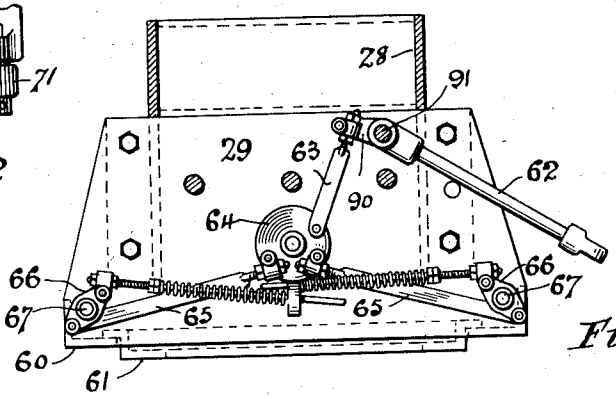


Fig. 9

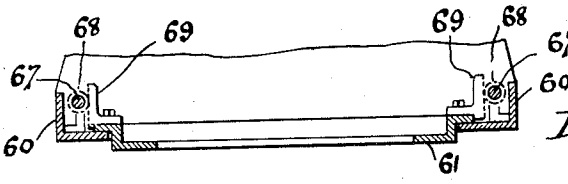


Fig. 10

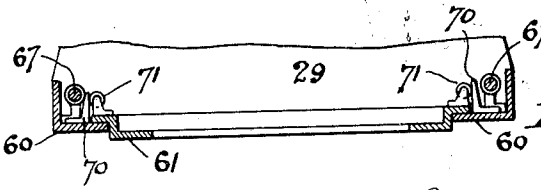


Fig. 11

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Patented Aug. 4, 1936

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UNITED STATES PATENT OFFICE

2,049,557

PHOTO COMPOSING MACHINE

Edward Eugene Cooper and Albert Theodore Troedel, Port Melbourne, Australia

Application February 12, 1935, Serial No. 6,210
In Australia December 21, 1934

4 Claims. (Cl. 95—73)

This invention relates to photographic step-and-repeat contact-printing in which a machine is employed carrying two or more, but preferably two, chase bearers in which negative holders are retained each over a fixed table on which is a sensitized photographic plate. Movements longitudinally and transversely of the negative holders over the tables are controlled in order that the picture or image on a negative can be transferred simultaneously to the plates and repeated step by step until the whole surface of a plate at each end of the machine is filled. The plates are then developed and afterwards used in a printing press in the usual way.

In such a machine arrangement of parts is required to ensure the great accuracy necessary when moving the members in which the negative holders are suspended. Even the slightest warping of the supporting means will lead to an accumulative error in the placing of the transfers or prints from negatives to plates.

It is further necessary, in a machine of the type indicated, to move the chases, in which the negative holders are mounted, near to the plates prior to the photographic prints being made and to lift the whole clear of said plates before moving the negatives the next step. This clearing movement is made to avoid injury to the colloidal surface upon the plates.

Our present invention, therefore, has for one of its objects to support properly the negative holders and chases suspended over the tables. This is effected by a stout beam or girder resting on a carriage or trolley adapted to be moved transversely in the machine and means are provided for moving the girder, with the suspended parts, over the trolley longitudinally in the machine.

A further object of the invention is to provide each chase with means for raising or lowering same in relation to the tables and the plates resting thereon. This is effected through systems of levers actuated from a common lever operated at the front of the machine and which include spindles arranged in the chase carriers to raise or lower the negative holders and their chases.

Means are installed in the machine for moving the beam or girder and the suspended parts over the tables, for adjusting the alignment of the carriage or trolley and for controlling the step by step movements of the parts. The mechanisms have already been described in our prior Letters Patent Number 1,999,831 dated the thirtieth day of April 1935, and are not claimed herein.

In the accompanying drawings:

Fig. 1 is a front elevation of the machine and Fig. 2 a plan view.

Fig. 3 shows in front elevation means for steadying the trolley on its carrying rails.

Fig. 4 is an end sectional elevation of the control tower, looking from the line Z of Fig. 1.

Fig. 5 is a fragmentary end sectional elevation of guide rollers of the girder on the line X, Fig. 1.

Fig. 6 shows in plan view means for adjusting the alignment of the trolley transversely of the machine.

Fig. 7 illustrates in perspective view the longitudinal scale bar, the setting plate and the notch bar holder.

Fig. 8 is a perspective view of the special notch bar with sets of notches of varying pitch.

Fig. 9 is a transverse sectional elevation of the negative holder and chase lifting means on line Y, Fig. 1.

Fig. 10 shows in like view the lift on line 1—2, Fig. 2, and

Fig. 11 also in like view shows the chase guides on line 3—4, Fig. 2.

Fig. 12 is a fragmentary plan view of the chase guiding means.

The framework or base **20** of the machine is fixed and supports transverse rails upon which the trolley and superstructure are erected and move. Also in the framework is a rail **22** bearing the transverse scale bar and there are two aligning bars **23** hereinafter described. The trolley consists of two vertical plates stayed or braced by rods **26**. To steady the trolley during operation of the machine parts, rollers **24¹**, Fig. 3, are attached to the plate **24** in such a way as to be suspended therefrom and to come under and in contact with the rails **21**. The trolley is moved through suitable gearing from the wheel **26a** and directional shafts **27** pass through the body plates **24** and are attached at their outer ends each to a chase bracket **29** as stays to the same. The brackets are supported over the tables **31**, on which are the sensitized photographic plates, by girders or beams **28** that move slidably over the carriage longitudinally of the machine on rollers **30** mounted on the carriage. The girder irons are braced transversely to form an integral whole and rollers **30a** also on the trolley guide and align the girder assisted by the shafts **27**.

A negative holder is held in each of the chases and is moved by the girder **28** with the brackets **29** longitudinally over the sensitized plates at each end of the machine and transversely through the trolley. Means are provided for printing the photographs from the negatives on the sensitized plates and afterwards for fixing the same for printing from the plates in a press. To keep the images in proper alignment it is very necessary to so adjust and arrange the parts of the machine that the longitudinal and transverse movements of the parts shall be at right angles to each other.

To this end, on a suitable support, such as one of the longitudinal shafts **27**, a bar **53**, called the setting bar, is mounted and is movable over a fixed scale **54** having the necessary calibrations. In the forward end the setting bar is fitted with a window **56**, through which the scale is read. Mounted on the girder **28** is the usual control tower **47** from which the necessary electric circuits and vacuum pipes emanate that are necessary for the purposes of printing upon the sensitized plates. The wheel **57**, Fig. 4, is also on the tower and actuates gearing that moves the superstructure longitudinally.

To properly align the superstructure on the rails the bars **23** are provided and carry each a plate **82** that is bolted at each side at the points **84** to an adjustment plate **83** in immediate contact with a bar **23**. The two opposing bolts are accommodated in slots in the plate **82**. On the adjustment plate **83** are rollers **85** that are mounted on eccentric spindles to bear against the edges of a rail **23** to swing the trolley into alignment in the framework. The plates **82** are connected in the machine to the superstructure through the stay rods **86** and brackets supported on the trolley rods **26**.

The longitudinal scale bar **54** may be associated with the notched bar holder **77** mounted on a stay rod **26** and employed with a pawl **78** on the setting bar **53**. In the holder the notch bar **79** will be held and relied upon to engage with the pawl **78** as the parts move longitudinally. Stops **80** may be used in place of the bar **79** but if the bar is employed, the character of its notches will be such as to suit the spacing of a particular job. Thus, there may be two sets of notches or teeth on each bar each set having a different pitch for application to a particular job.

It is essential, when printing from the negatives to the sensitized plates, that the negative holders shall be lifted from the sensitized plates after each print has been made and before the next movement over the plates is effected.

The brackets **29**, one of which is on each end of the girder **28**, bear the chase carriers **60**, a chase **61** being in each carrier. Each chase in turn bears a negative holder, not shown on the drawings, and holder and chase can be raised or lowered as desired. This is effected through a common lever **62** pivotally mounted on a spindle **91** mounted in the members **29** and carrying two short levers **90** each attached to a rod **63** that is connected with the disc **64** on each bracket **29**. Other rods **65** articulate with the disc at points below **63** and at their outer ends are joined to the rocking levers **66** each of which is on a spindle **67** mounted along the sides of the chase carriers **60**. On the spindles are pinions **68** that are in mesh with rack irons **69** mounted on and secured to a chase **61**. Thus, when the lever **62** is raised the disc **64** is rotated clockwise and the levers **66** are rocked to rotate the spindles **67** and operate the pinions **68** in the racks **69** to raise the chases **61**. The movement of the lever **62** downwards will reverse the position of same. On the chase carrier **60**, that is securely attached to the bracket **29**, is an iron or irons **70** at each side and on the chase **61** wheels **71** engage the irons. The wheels **71** may be eccentrically mounted in order to adjust the position of the chase **61** within narrow limits should such be desired.

It will be observed that the girder **28** actually supports the brackets **29** suspended over the tables. The girder is made substantial enough to ensure that while resting on the trolley **24** with one end projecting further outwards than the other end, there shall be no warping or movement of said girder from the true horizontal.

Having now described our invention, what we claim as new and desire to secure by Letters Patent is:—

1. In a photo composing machine of the type indicated and having a trolley adapted to move transversely therein, the provision of a stout girder slidably supported on the trolley, a bracket suspended from each end of the girder, a chase carrier in a bracket, a chase in the carrier and a negative holder in said chase, a table bearing a sensitized plate under each negative holder, means for moving the girder and the suspended parts longitudinally over the trolley and with the trolley transversely step by step and means for printing the images from the negatives on to said plates.

2. A photo composing machine as defined in claim 1, in which are rollers on the trolley to support the girder, guide rollers at the top side of trolley to guide the girder, rods between the trolley sides and directional shafts that pass through the trolley and are attached as stays to the suspended brackets.

3. In a photo composing machine of the type indicated and having a trolley adapted to move transversely therein, the provision of a stout girder slidably supported on the trolley, a bracket suspended from each end of the girder, a chase carrier in a bracket, a chase in the carrier and a negative holder in a chase, a table bearing a sensitized plate under each negative holder, means for moving the girder and the suspended parts longitudinally over the trolley and with the trolley transversely step by step, having a lever operatively connected with the suspended chases and negative holders to raise same prior to each step by step movement and to lower same before each print on the sensitized plate is made, and means for printing the images from the negatives on to said plates.

4. In a photo composing machine of the type indicated and having a trolley adapted to move transversely therein, the provision of a stout girder slidably supported on the trolley, a bracket suspended from each end of the girder, a chase carrier in a bracket, a chase in the carrier and a negative holder in a chase, a table bearing a sensitized plate under each negative holder, means for moving the girder and the suspended parts longitudinally over the trolley and with the trolley transversely step by step, having a lever operatively connected with the suspended chases and negative holders to raise same prior to each step by step movement and to lower same before each print on the sensitized plate is made, means for printing the images from the negatives on to said plates, and in which a spindle is between the brackets on the girder ends, a hand lever loosely mounted on the spindle, rotatable discs on the brackets operatively connected with the lever, spindles along the sides of the chase carriers, a rocking lever on each spindle, rods connecting the rocking levers with the discs, pinions on the spindles and rack irons on the chases that engage with the pinions that roll on the rack irons when the hand lever is operated.

EDWARD EUGENE COOPER.
ALBERT THEODORE TROEDEL.