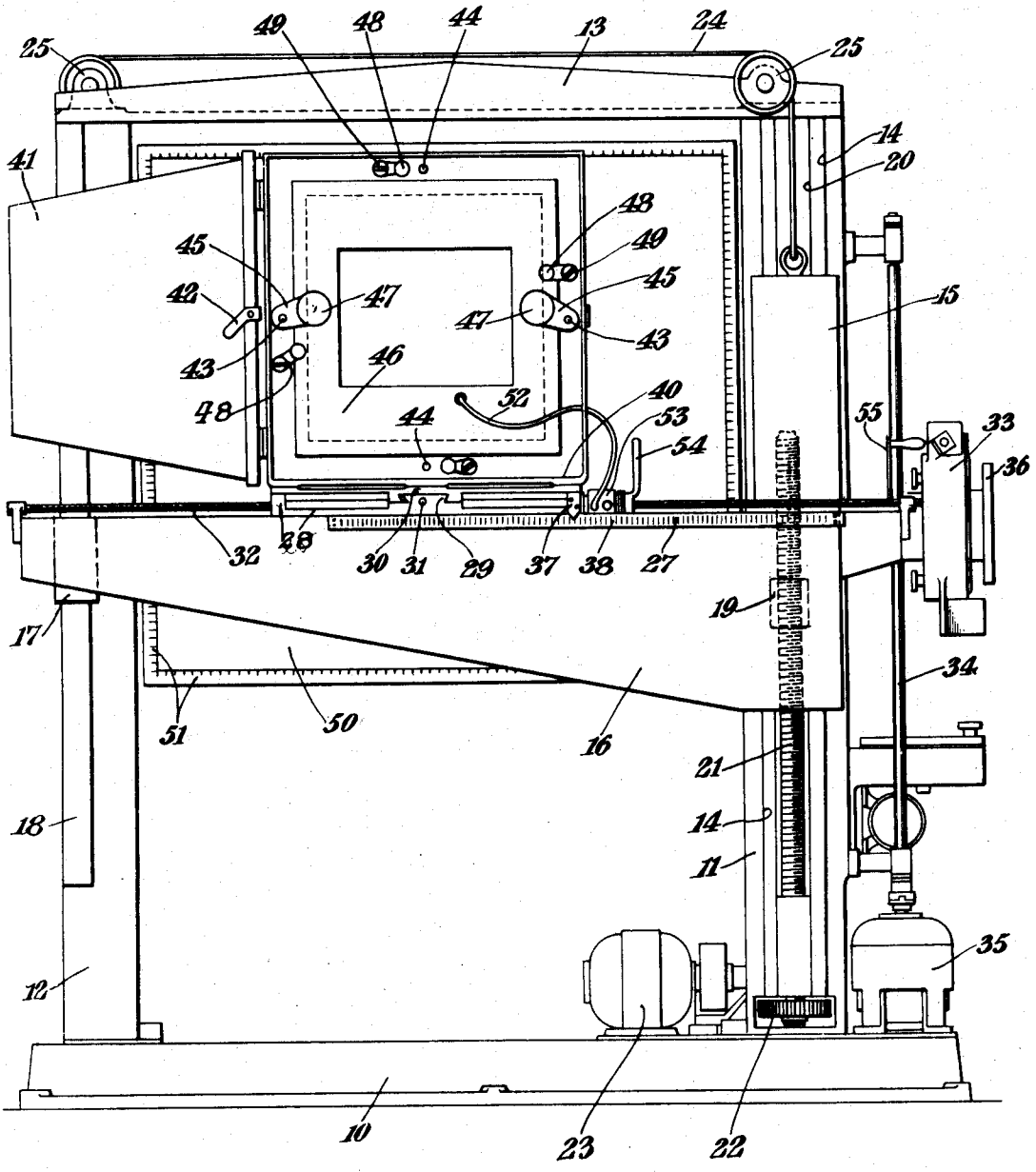
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PHOTOMECHANICAL MACHINE

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Inventor

Harry C. Jones

By his Attorney

Warren E. Willis.

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HARRY C. JONES, OF NEW YORK, N. Y.

## PHOTOMECHANICAL MACHINE

Application filed March 9, 1927. Serial No. 173,811.

This invention relates to photomechanical apparatus as employed in reproducing an image from a negative, upon an object having a sensitized blank surface.

In this specification the term "negative" is used as referring generically to any translucent substance, bearing the configuration of an object, such as a photographic plate, a film of celluloid or equivalent material, a sheet of paper or of textile fabric, the same being treated to permit the passage of light except through the image, or its surrounding surface, as the case may be.

The term "blank" is to be understood as applied to a plate, film or sheet provided with an emulsified or sensitized coating, such as metallic salts in solution, adapted to be acted upon by the actinic properties of light rays, the blank preferred in the present case being a thin plate or sheet of zinc.

Machines for this purpose are ordinarily quite clumsy, require very considerable space, require highly skilled operators and are initially almost prohibitive in expense.

The apparatus herein described is quite similar to that shown and described in my co-pending application for photo-mechanical machines, filed March 13, 1926, Serial Number 94,421, which relates more particularly to means for adjusting the negative with reference to the blank in a manner to superpose the negative predeterminately and with precision, and to which this application is to be regarded as a companion.

One of the objects of the present invention is to provide a simple and relatively inexpensive apparatus of the nature described, capable of being easily and accurately operated by a comparatively unskilled operator.

A further feature resides in the reduction of manufacturing costs, due to the simplification in construction and improvements which will become apparent as the description progresses, the same being illustrated in the accompanying drawing, forming part hereof, the figure shown being a rear elevational view of a preferred embodiment of the invention.

The apparatus includes a base 10, essentially an elongated rectangle in plan on which is supported a suitable frame including uprights 11 and 12, connected by a cross beam 13 at their upper ends secured together to constitute a rigid frame.

The right hand upright 11 has undercut grooves 14, in its face adjacent the sides, to receive corresponding inreaching guides formed on the rear of a vertically movable slide 15 and to this slide is securely bolted an arm or beam-like member 16 extending rigidly at a right angle past the face of the upright 12, to which it is slidably engaged by a lug 17 operative in a longitudinal recess 18 in the upright. The beam-like member is adapted to support a suitable carrier for holding a negative in a face-to-face relation to a sensitized blank, as will hereinafter more clearly appear.

An internally threaded block 19, carried by the arm 16, extends through an elongated opening 20 in the face of the upright 11 to engage a jack-screw 21 journalled in the lower portion of the upright.

On the lower end of the jack-screw 21 is fixed a spur gear 22 driven by a gear train (not shown) in operative connection with a reversible motor 23 by which the arm may be positively and speedily moved up and down, such movement being facilitated by a counterbalancing device indicated by the cable 24, attached to an eye set in the slide 15 and running over pulleys 25 rotatably mounted at the ends of the beam 13 to a weight (not shown) at the rear of the upright 12.

The arm 16 is provided along its upper surface with an undercut guideway 27 to engage a cooperating groove formed in a carriage 28 having a transverse, raised undercut guideway 29 used to carry a negative plate holder registry frame support 30 movable by a screw 31.

A screw 32 is revolubly mounted in bearings at the ends of the arm 16 to extend lengthwise thereover and is in threaded engagement with some part of the carriage 28, thereby providing means for moving the carriage and elements carried by it when the screw is rotated.

The screw 32 is driven in either direction by a gear train contained in the gear box 33, the train being actuated by a splined vertical

shaft 34 driven by a motor 35, thus shifting the carriage 28 along the arm 16 in either direction, final adjustment of the carriage being obtainable by use of the hand wheel 36, rough adjustment being indicated by an index finger 37 as it moves over a scale 38 on the arm below the guideway 27.

Mounted on the support 30 is a registry frame 40 to which is hingedly connected at one of its lateral edges a lamp hood 41, here shown in an outturned open position, provided with a catch 42 engageable with a corresponding fixed element on the opposite side of the hood, and it is to be understood that this hood carries a lamp suitable for photographic printing.

Fixed in the frame 40 are pairs of dowel pins 43 and 44, the former being on the horizontal center and the latter on the vertical center, these dowels being engageable in holes in the outer ends of dowel receiving arms 45 pivoted on a negative holder 46, the arms being clamped when in adjusted position by knobs 47.

The holder 46 is further held in adjustment by catches 48 pivoted to the frame 40 by screws 49, the free ends of the catches reaching over the frame on any of its four edges.

In the present embodiment a vacuum is used to draw the negative into printing relation with a blank carried on a suitable support or press bed 50 having scales 51 on each of its four edges, the bed being arranged to assume a vertical position, parallel and closely adjacent the negative as carried in the holder 46, a highly flexible seal, not shown, as rubber, being carried circumjacent the negative in a manner well understood.

Entering into the intervening space between the edge of the negative and inner portion of the seal is a flexible tube 52, its outer end communicating with a vacuum valve 53 controlled by a hand lever 54 or an extension lever 55, the same being convenient from the end of the machine and operatively engaging the valve rod, this valve being in communication with an air pump by which the vacuum is produced.

It is to be understood however that the operation of the machine is not confined to the vacuum system, as it is clearly apparent that other equally efficient mechanical means may be substituted for the means described.

Due to the extreme accuracy in adjustments necessary to the satisfactory operation of the machine, highly refined features for attaining the same are disclosed in the mentioned pending application and need not be repeated here, this application being substantially confined to the novel mechanical features of support, adjustment and negative frame securing means.

In operation a sensitized blank is laid on the bed 50 and held in position by any convenient means as usual on similar machines, the blank being positioned in accordance with the scales 51, either from the center or corners of the bed.

The registry frame carrier is moved into position for exposure, the bed having previously been raised, the negative in its frame adjusted on the carrier to be clamped in position, thereafter the vacuum applied, the lamp swung into operative position, fixed therein and the imprint made.

However, as changes of construction could be made within the scope of the invention, it is intended that all matter contained in the foregoing description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A photomechanical apparatus comprising a base having a pair of rigid uprights, a slide engaging one of said uprights to move vertically thereon, a horizontal arm on said slide extending to and guided on the other of said uprights, a carriage slidably engaged on said arm, a transverse slide on said carriage, a negative frame carrier on said slide, means for adjustably securing a negative frame therein, a lamp associated with said carrier, and a sensitized blank-supporting bed parallel with said negative frame.

2. In a photomechanical apparatus, the combination with a negative frame carrier and a negative frame disposable thereagainst, of dowel pins fixed in said carrier at diametrically opposed points, a pair of dowel receiving arms pivoted on said frame to selectively engage the dowel pins, and means for clamping said arms when in adjusted positions.

3. In a photomechanical apparatus, the combination with a negative frame carrier and a negative frame disposable thereagainst, of dowel pins fixed in said carrier in horizontal and vertical planes relative to the center of the carrier, dowel arms pivoted on said frame to engage with either the horizontal or vertical dowel pins, and knurled knobs associated with the pivots of said arms whereby they may be clamped when in adjusted position.

4. In a photomechanical apparatus, the combination with a negative frame carrier and a negative frame disposable thereagainst, of a pair of dowel pins fixed in said carrier at points directly above and below respectively and a pair of dowel pins one at each side of the center line of said carrier, pivoted dowel arms carried adjustably on said frame to selectively engage either pair of said dowel pins, means for clamping said arms in adjustment, and catches pivoted on said carrier to engage said frame.

5. In a photomechanical apparatus, the combination with a negative frame carrier, and a negative frame disposable thereagainst, of dowel pins fixed in said carrier at diametrically opposed points, a pair of dowel receiving arms pivoted on said frame to selectively engage the dowel pins, means for clamping said arms when in adjusted positions, and means for securing the adjusting means to cause the replacement of the negative after removal to result in the negative occupying the same relative position as before removal.

6. In a photomechanical apparatus, the combination with a negative frame carrier and a negative frame disposable thereagainst, of a pair of dowel pins fixed in said carrier at points directly above and below respectively, and a pair of dowel pins one at each side of the center line of said carrier, pivoted dowel arms carried adjustably on said frame to selectively engage either pair of said dowel pins, means for clamping said arms in adjustment, catches pivoted on said carrier to engage said frame, and means for securing said adjusting means to cause the replacement of the negative after removal to result in the negative occupying the same relative position as before removal.

7. In a photomechanical apparatus, a single frame consisting of a base and uprights rigid thereon, a support carried by said frame for holding a sensitized blank in a given position, a carrier for holding a negative in a face-to-face relation to the sensitized blank, and means for adjustably supporting said carrier in front of said blank and including a single beam-like member mounted upon said uprights for vertical movement thereon and for only vertical movement in relation to said base.

8. In a photomechanical apparatus, a single frame consisting of a base and uprights rigid thereon, a support carried by said frame for holding a sensitized blank in a given position, carrier-supporting means mounted upon said uprights for vertical movement thereon and for only vertical movement in relation to said base and including a single beam-like member, a carrier mounted upon said beam-like member for both longitudinal and transverse movements with respect to such beam-like member, said carrier being adapted to hold a negative in a face-to-face relation to the sensitized blank, means for raising and lowering said beam-like member with said carrier thereon, means for moving said carrier longitudinally of said beam-like member, and means for moving said carrier transversely of said beam-like member, the last three means being operable independently of each other to effect vertical, longitudinal and transverse adjustments of said carrier.

9. In a photomechanical apparatus, a single frame consisting of a base and uprights rigid thereon, a support carried by said frame for holding a sensitized blank in a given position, carrier-supporting means mounted upon said uprights for vertical movement thereon and for only vertical movement in relation to said base and including a single beam-like member, a carrier mounted upon said beam-like member for both longitudinal and transverse movements with respect to such beam-like member, said carrier being adapted to hold a negative in a face-to-face relation to the sensitized blank, a guide for insuring movement of said carrier on the beam-like member parallel to the sensitized plate, a second guide for insuring movement of the carrier transversely of the beam-like member toward and away from the sensitized blank along a line normal to the same without disturbing the parallel relation of the carrier to the sensitized plate, whereby, on the one hand, face-to-face engagement of the negative with the sensitized blank is insured preparatory to the printing operation and whereby, on the other hand, a sufficient spacing of the negative from the sensitized plate is insured to enable the carrier to be moved parallel to the sensitized blank, means for raising and lowering said beam-like member with said carrier thereon, means for moving said carrier longitudinally of said beam-like member, and means for moving said carrier transversely of said beam-like member along said line normal to the sensitized blank, the last three means being operable independently of each other to effect vertical, longitudinal and transverse adjustments of said carrier.

Signed at New York, in the county of New York and State of New York, this 25th day of February, A. D. 1927.

HARRY C. JONES.