

Sept. 24, 1929.

W. N. MISURACA

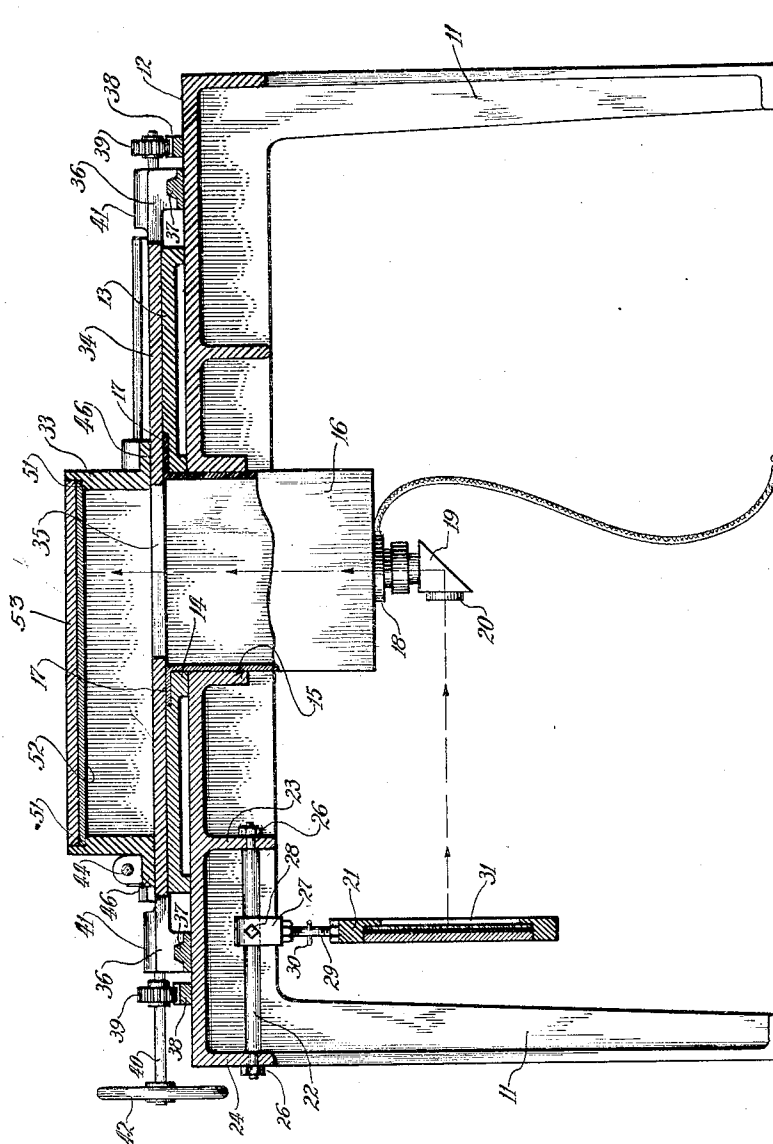
1,729,176

PHOTOGRAPHING MACHINE

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3 Sheets-Sheet 1

Fig. 1.



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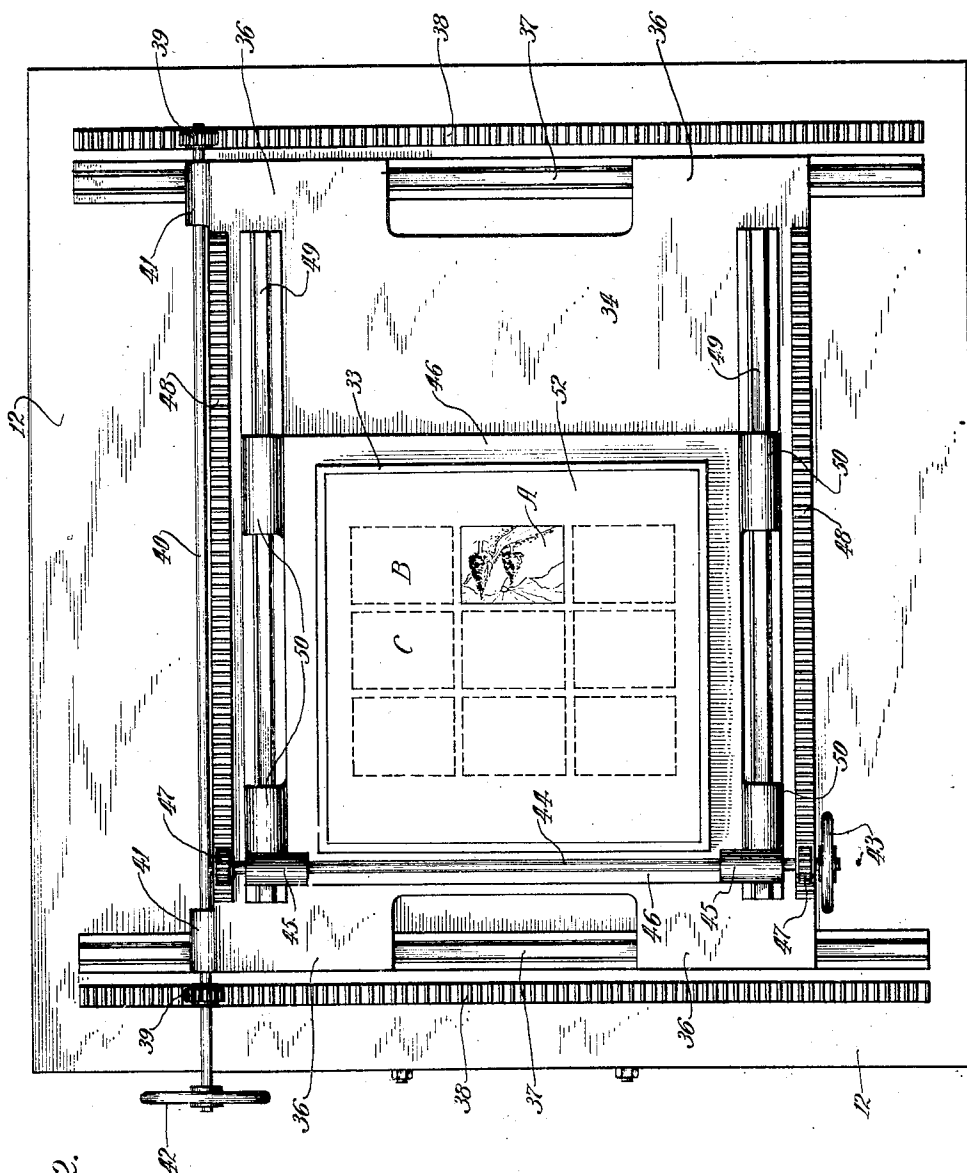


Fig. 2.

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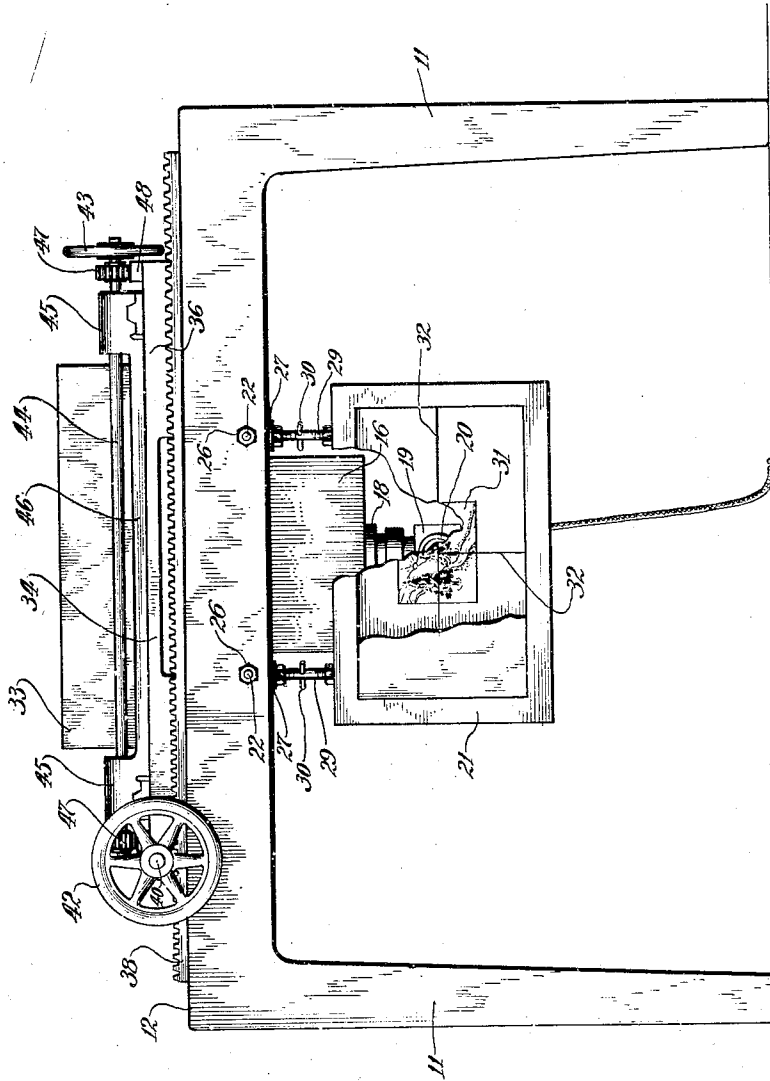
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Fig. 3.



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UNITED STATES PATENT OFFICE

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PHOTOGRAPHING MACHINE

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The present invention relates to a photographing machine, such as is used in lithographing work for the duplication of a design upon a sensitized stone, zinc, or any other type of plate from which a printing plate is developed for transferring purposes.

In machines of this general character, it has been the practice to assemble upon an assembly negative a series of small negatives which have been photographically obtained from the design to be transferred. This negative is made of transparent paper prepared especially for the purpose, to which the desired number of individual negatives are attached in their proper alignment. After being arranged, the assembled negative is positioned in the machine and a sensitized zinc plate clamped into a frame and pressed against the negative, after which a strong light is permitted to act upon the sensitized plate and negative to transfer the outline of the negative to the zinc plate. The zinc plate is then chemically treated and prepared to be used in a printing press. Where I have referred to a zinc plate, it should be understood that a copper, aluminum, or steel plate, or the regular lithographers stone could be used as well.

It has been the practice on occasions to take only a few negatives of the design and assemble them together to form only a small section of the completed printing plate. This is particularly so in the case of a very small design wherein a large number is to appear on the finished plate. This is accomplished by moving the sensitized plate about in such manner as to place any part of the plate over the negative at will. This multiple light printing is disclosed in the prior art in constructions wherein it is necessary to clamp the sensitized plate to the negative during the printing operation.

In the present invention, the negative is entirely eliminated, thereby simplifying the operation and speeding up the production of the completed plates. Instead of taking several negatives of the object and assembling them to form a working negative, the present invention contemplates positioning of the original design within a suitable retaining

frame adjustably mounted in a machine and reflecting the image of the design directly upon the sensitized zinc plate and thereafter exposing it in the manner employed in any commercial camera to fix the reflection upon the zinc plate. By moving the zinc plate through suitable instrumentalities into different positions over the reflected image, the required number of exposures upon the zinc plate are thereby directly obtained. The plate is then chemically treated and prepared for use in the printing press as before.

The principal object of the invention, therefore, is to provide a machine in which the reflection or image of an original design is directly exposed to a sensitized zinc plate without the use of any negative whatsoever, said zinc plate being thereafter employed, after chemical treatment, to transfer the reproduced image in a printing press; and to arrange the apparatus in such manner that a relatively extensive sensitized plate can be handled, so that a large number of small designs can be produced on said plate and thereafter by the aid of said plate lithographed on a corresponding extensive sheet of tin plate, so that a large number of such small designs can be printed at once on the tin plate, after which the tin plate can be cut between the designs and the cut pieces folded into box bodies and the like, resulting in a great economy in the manufacture of lithographed tin boxes and other articles.

A further object of the present invention is to eliminate the use of a negative in the production of zinc transferring plates.

A still further object of the invention resides in the provision of a machine having a minimum of operating parts capable of adjustment throughout and providing a machine which is rapid in operation.

In said drawings:

Figure 1 is a vertical longitudinal sectional view of a preferred embodiment of the machine;

Fig. 2 is a top plan view, with the cover of the dark chamber removed and illustrating the position of the ground glass, upon which the image is reflected;

Fig. 3 is a front elevation of the machine,

partially broken away for better illustration of certain of the operating elements.

Referring to the drawings, the numeral 11 represents supporting legs for a table or base portion 12, having mounted upon the surface thereof a support 13 provided with a substantially centrally disposed aperture 14 coinciding with a corresponding flanged aperture 15 in the table 12. A stationary camera 16 is positioned within these apertures and maintained in vertical alignment by means of an outwardly extending flange 17 preferably integral with the portion 16. Attached to the bottom of the camera 16 and substantially at its center is an image projecting head, consisting of a shutter 18, an oblique mirror 19 and a lens 20, such as is used in any standard photographic camera. Object holding means such as a design retaining frame 21 is suspended from the under side of the table 12 by means of the horizontal rods 22, which are held in position by the depending webs 23 and 24 of the table 12 and the nuts 25 and 26. Mounted upon these rods 22 are adjustable bearing blocks 27 adapted to be locked against longitudinal displacement by means of a set screw 28. The frame 21 is connected to the bearing blocks 27 by means of studs 29, having right hand threads at one end and left hand threads at the other end. A pin 30 is positioned midway between the ends of each of said studs 29, as best illustrated in Fig. 3, by means of which the frame 21 may be vertically adjusted.

A design, such as the photograph 31 illustrated in Fig. 3, is placed in the retaining frame 21 and squared up with the index lines 32 (Fig. 3) so that the image of the design may be reflected onto the sensitized plate in its proper position, as hereinafter described. The design thus positioned in the retaining frame 21 is horizontally projected to the lens 20 by means of light striking the surface of the design, and thence projected to the mirror 19 from which it is reflected vertically through the camera lens to the sensitized plate. The sensitized plate is mounted in a horizontal position in an adjustable dark chamber and plate carrier 33 now to be described.

As best shown in Fig. 1, a transverse slide member 34, having a longitudinal opening 35, is mounted upon the support 13 and through this opening, the reflected image of the design passes to the sensitized plate. Integral with the sides of the slide 34 are slideway blocks 36 which engage V shaped slideways 37 positioned transversely upon the surface of the table 12 and by means of which the slide member 34 is guided transversely across the stationary part of the camera 16. A rack 38 is positioned adjacent each of the slideways 37 and meshes with the pinions 39, which are mounted upon the extremities of the slide member adjusting shaft 40. The said shaft

40 is journaled in bearings 41 integral with the slide member 34. At the forward extremity of the shaft 40, there is mounted a wheel 42 by means of which, through the described mechanism, the slide member 34 is preferably manually moved transversely across the table 12.

Mounted upon the upper surface of the slide 34 is the adjustable dark chamber and plate carrier 33, which is manually moved across the table 12 in a longitudinal direction by means of a similar wheel 43 mounted upon a shaft 44 journaled in the bearings 45, preferably integral with the outwardly extending flange 46 of the adjustable chamber 33. Pinions 47 are mounted upon the shaft 44 and engage racks 48 by means of which the chamber may be guided in its movement across the table by similar V shaped slideways 49 mounted upon the slide 34 adjacent the racks 48 and engaged by slideway blocks 50 integral with the chamber 33. (See Fig. 2.) It may be thus readily seen that by means of the wheels 42 and 43, the adjustable chamber 33 may be adjusted to any desired position with relation to the stationary camera at will.

In carrying out the invention, a ground glass plate 52 is placed upon the ledge 51 of the adjustable chamber 33, and the image of the design 31, which is held in the retaining frame 21, is reflected to the glass 52 through the medium of the projecting head described. The image of the design 31 is best illustrated at A in Fig. 2. By means of the studs 29, the image reflected to the ground glass 52 is squared up, or aligned to the desired position. When the image has been properly positioned, the ground glass 52 is removed and a sensitized plate, such as the well known zinc plate, is inserted upon the ledge 51 of the movable plate holder and a suitable cover 53 may be placed over the plate to prevent extraneous light from passing through the joint between the zinc plate and the plate holder chamber. The wheels 42 and 43 are adjusted to bring the holder 33 and the sensitized plate to proper position over the space occupied by the reflected image upon the ground glass, as described above. For example, the rectangular space designated "B" on Fig. 2 is first moved to the proper position and the actuation of the shutter 18 exposes the sensitized plate to the reflected image. After this exposure, the wheel 43 is manually operated to bring the rectangular space "C" into the position formerly occupied by the space "B" and this latter space is exposed to the action of light to impress the latent image on the zinc plate. This operation is repeated to expose in succession the adjacent spaces on the zinc plate until the entire surface has received all of the reproduced images desired. After complete exposure has been obtained, the plate is removed and chemically treated to enable it to

be employed as the well known zinc plate in offset printing processes.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention, or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. The combination of a table having an aperture down through the same, a camera having a lens arranged on a vertical axis, means for reflecting light from a design to be copied up through said lens and thence through said aperture, an object holder at the under side of said table adjustable relative to said light reflecting means, a sliding dark chamber having an open under side and mounted above said table so as to enclose said aperture and having a light-tight fitting on said table, said chamber having means for holding a sensitized plate, and means for sliding said chamber end-wise and side-wise of said table while enclosing said aperture.

2. The combination of a table having an aperture down through the same, a camera having a lens arranged on a vertical axis, means for reflecting light from a design to be copied up through said lens and thence up through said aperture, an object holder at the under side of said table adjustable relative to said light reflecting means, a sliding dark chamber having an open under side and mounted above said table so as to enclose said aperture, said chamber having a light-tight fitting on said table and tending by gravity to exclude light from entering between the chamber and table and having means for holding a sensitized plate above said aperture, and means for sliding said chamber end-wise and side-wise of said table while enclosing said aperture.

3. The combination of a table having an aperture down through the same, a camera having a lens arranged on a vertical axis, means for reflecting light from a design to be copied up through said lens and thence through said aperture, an object holder at the under side of said table adjustable relative to said light reflecting means, a sliding dark chamber having an open under side and mounted above said table so as to enclose said aperture, said chamber having means for holding a sensitized plate, and means for sliding said chamber end-wise and side-wise of said table while enclosing said aperture, and a horizontal sliding part interposed between said dark chamber and the table and having a light-tight fitting with said parts and having a light opening from the camera to the said dark chamber and otherwise excluding light,

and means for moving said sliding part horizontally.

4. The combination of a table having an aperture down through the same, a camera having a lens arranged on a vertical axis, means for reflecting light from a design to be copied up through said lens and thence through said aperture, an object holder at the under side of said table adjustable relative to said light reflecting means, a sliding dark chamber having an open under side and mounted above said table so as to enclose said aperture, said chamber having a ledge for holding a ground glass or a sensitized plate, means for sliding said chamber endwise and sidewise of said table while enclosing said aperture, and a cover above said ledge.

5. The combination of an elevated table having an opening therein to receive vertical light rays, a transverse slide member having a light-tight sliding mounting on said table and having an opening therein registering with the opening in the table and larger transversely than said opening in the table, a plate carrier adapted to receive a plate at its upper side and having an open bottom surrounding the opening in the slide and having a light-tight sliding mounting on said slide, means for sliding the slide on the table, means for sliding the plate carrier on the slide, whereby any part of a plate may be brought into the vertical axis of the table opening, and a camera having its lens in said axis to direct light on said plate, and means for reflecting horizontal light rays upward into said camera.

6. The combination of an elevated table having an opening therein, a transverse slide member having a light-tight sliding mounting on said table and having an opening therein registering with the opening in the table and larger transversely than said opening in the table, a plate carrier adapted to receive a plate at its upper side and having an open bottom surrounding the opening in the slide and having a light-tight sliding mounting on said slide, racks and pinions for sliding the slide on the table, racks and pinions for sliding the plate carrier on the slide, whereby any part of a plate may be brought into the axis of the table opening, and a camera having its lens in said axis to direct light on said plate.

7. The combination of an elevated table having an opening therein, a transverse slide member having a light-tight sliding mounting on said table and having an opening therein registering with the opening in the table and larger transversely than said opening in the table, a plate carrier adapted to receive a plate at its upper side and having an open bottom surrounding the opening in the slide and having a light-tight sliding mounting on said slide, means for sliding the slide on the table, means for sliding the plate carrier on the slide, whereby any part of a plate may be brought into the axis of the table opening, a

camera having its lens in said axis to direct
light on said plate, an object-holder depend-
ing from the table, means for adjusting the
object holder relative to the camera, and light-
5 reflecting means arranged between the object-
holder and the said lens.

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