No. 778,938. PATENTED JAN. 3, 1905.

N. D. WYMAN.

PHOTOGRAPHIC PRINTING APPARATUS.

APPLICATION FILED APR. 6, 1904.

2 SHEETS—SHEET 1.

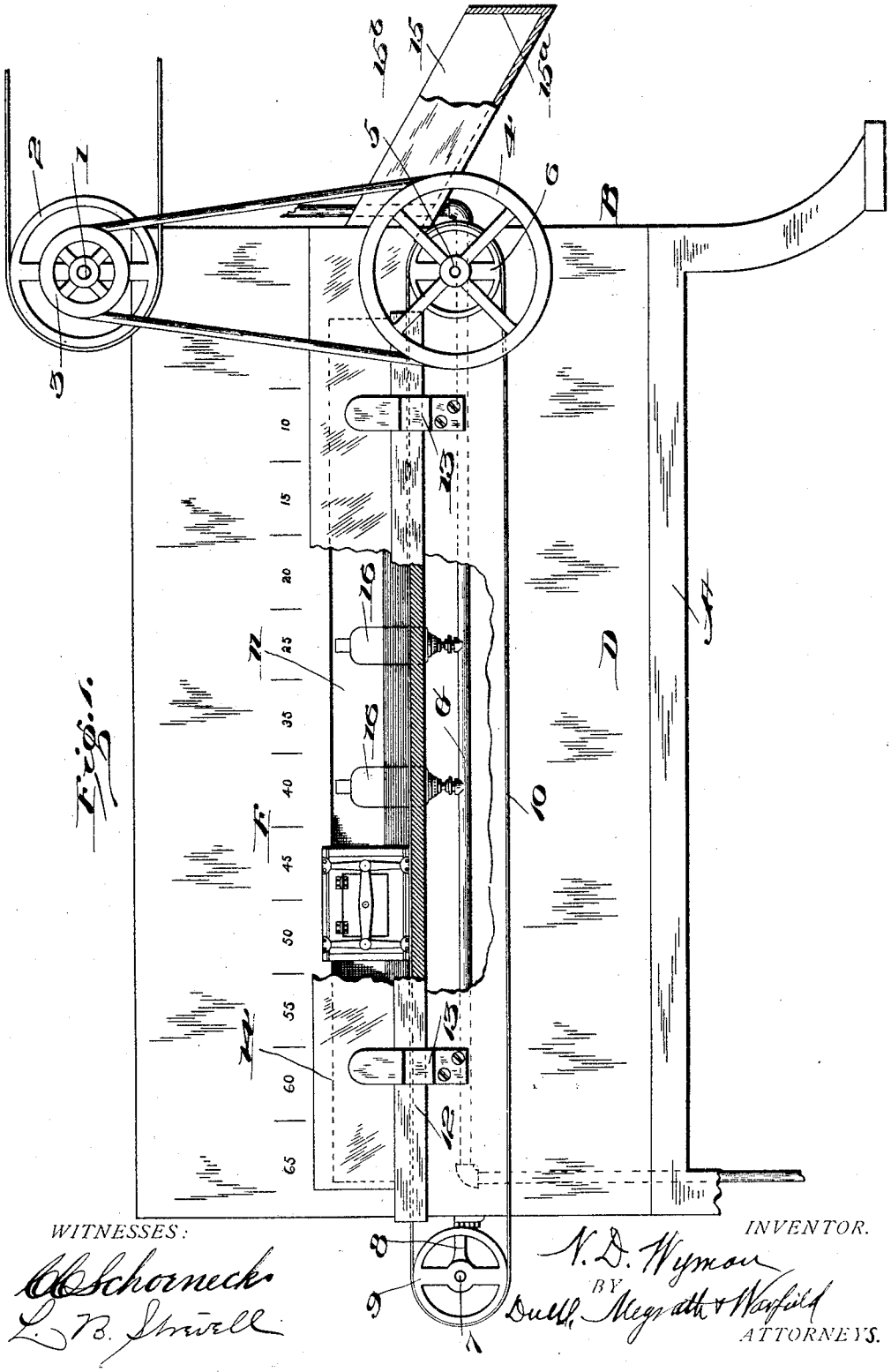


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 2.

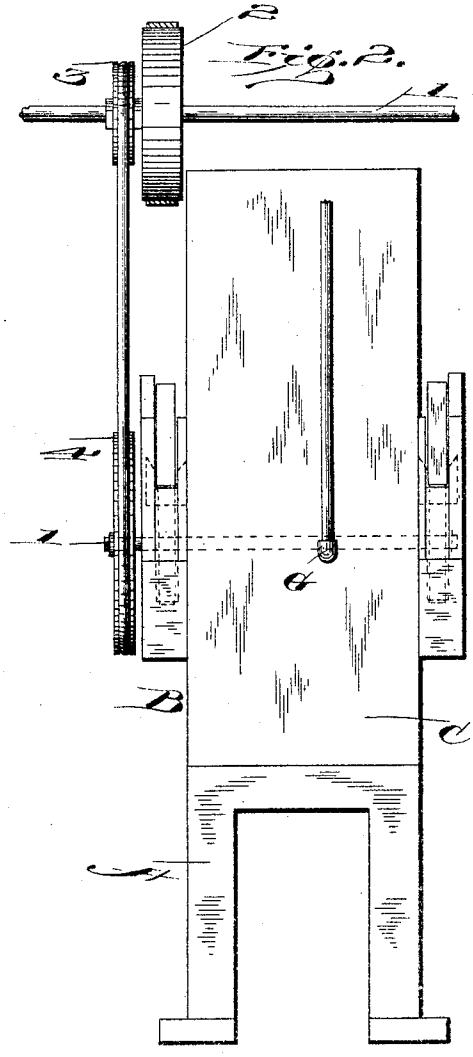


Fig. 3.

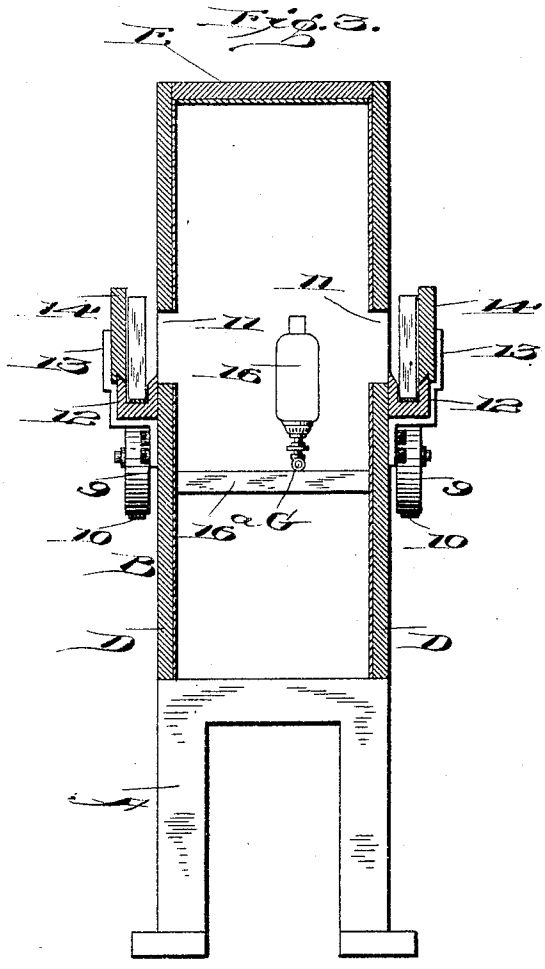
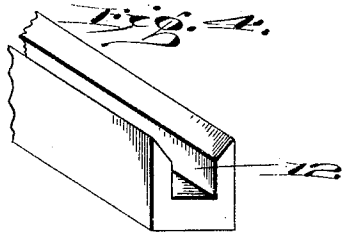


Fig. 4.



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No. 778,938. Patented January 3, 1905.

UNITED STATES PATENT OFFICE.

NEHEMIAH DWIGHT WYMAN, OF ARLINGTON, NEW JERSEY, ASSIGNOR TO UNDERWOOD & UNDERWOOD, OF ARLINGTON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PHOTOGRAPHIC-PRINTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 778,938, dated January 3, 1905.

Application filed April 6, 1904. Serial No. 201,803.

To all whom it may concern:

Be it known that I, NEHEMIAH DWIGHT WYMAN, residing at Arlington, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Photographic-Printing Apparatus, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to photographic-printing devices.

One of the objects thereof is to provide a device of the above nature which shall automatically regulate the time of exposure of the printing-frames and which shall be of simple and inexpensive construction.

Other objects will be in part obvious and in part pointed out hereinafter.

In the accompanying drawings, Figure 1 is a side elevation of one of various possible embodiments of my invention. Fig. 2 is an end elevation of the same looking in the direction indicated by the arrow shown in Fig. 1. Fig. 3 is a cross-section taken on lines 3 3 of Fig. 1. Fig. 4 is a detail view of a part of a channel member.

Similar reference characters refer to similar parts throughout the several views.

A represents, broadly, a supporting-base of any desired material, upon which a rigid box-like structure or chamber B is formed by end walls C and side walls D. In order to prevent loss of light and to stiffen this chamber, it is preferably provided with a top E. This chamber is also lined with "tin" or other suitable material in order to prevent loss of light by absorption by the walls thereof.

Mounted above chamber B, adjacent to one end thereof, is a main driving-shaft 1, actuated by pulley 2 or any other desired means. Pulley 3 upon shaft 1 is adapted to drive, preferably by belt or rope, a pulley 4 upon the shaft 5, located below shaft 1 and parallel thereto. Upon shaft 5 are also secured pulleys 6, mounted upon either side of chamber B and closely adjacent to the side walls thereof. Upon the opposite end wall C is rigidly mounted a counter-shaft 7 by means of bearing-piece 8, which counter-shaft supports two pulleys 9, identical in size with pulleys 6 and mounted directly opposite to them, so as to receive belts 10 delivered thereby and maintain said belts in a level position.

As the mechanism upon both sides of chamber B is identical, that upon one side only will be described.

Extending longitudinally of side wall D is an opening 11, corresponding in its vertical dimension to the width of the printing-frames which it is desired to use. A grooved member or channel 12, of wood or other desired material, is secured to the side wall by means of supports 13, directly below opening 11 and parallel thereto. This channel, which is of a width adapted to accommodate the desired printing-frames and permit them to slide therein, has its floor approximately in line with the upper side of belt 10 and serves to guide the same. A rear support 14 is adapted to be fitted by a tongue-and-groove joint or other desired means upon the outer wall of channel 12 and is maintained in vertical position by supports 13. The channel terminates in a receptacle in the nature of a downwardly-inclined slide 15, the lower end of which is closed by a wall 15^a, as shown in Fig. 1, and the sides 15^b of which are of approximately the width of the printing-frames.

The wall C above opening 11 is preferably graduated by means of equidistant marks into a scale F for the purpose hereinafter explained.

An artificial source of light is provided within chamber B at the same level as openings 11. This is accomplished in this embodiment of my invention by means of a series of gas-lamps 16, supplied by piping G, which is supported within chamber B upon cross-bars 16^a. These lamps are preferably inclosed in globes of a nature suited to diffuse the light with a maximum uniformity. They are preferably arranged parallel to side walls D and may, if desired, be placed nearer one opening 11 than the other for a purpose hereinafter explained.

The operation of this embodiment of my invention is as follows: The printing-frames prepared for exposure are placed within channel 12 and fitted loosely therein, resting upon the moving belt 10. In this position they are constantly exposed to the source of light until they have reached the end of the channel adjacent shaft 5 and are automatically deposited in slide 15, in which, as they are protected by sides 15^b, they remain indefinitely without harm. The length of exposure may be accurately predetermined within certain limits by means of inserting the frames at the proper point on scale F. If the source of light is placed nearer one opening than another, an equal length of exposure upon the two sides will produce an unequal printing effect, and the side may be chosen which is best adapted to the work in hand.

Various modifications of the above embodiment of my invention will be readily suggested. For example, this device is eminently suited for use with certain recent types of electric lamps in place of the gas-lamps shown. Again, other traveling means could be substituted for the belt shown, as a sprocket-chain, or the belt may be provided with projections in order to render its action more positive. For the above reasons I desire the above description and accompanying drawings to be interpreted as merely illustrative of my invention and not in a limiting sense.

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

1. A source of light, a printing-frame, and means for moving said frame within the range of said source of light for a predetermined time.

2. A chamber having an opening in the walls thereof, a source of light therein, a printing-frame, and means to move said frame past said opening.

3. A source of light, a guide or channel, a printing-frame, and means for moving said frame in said channel within the range of said source of light.

4. A source of light, a printing-frame, and automatic means for moving said frame within the range of said source of light for a predetermined time.

5. A source of light, a guide or channel, a printing-frame, and means for moving said frame in said channel within the range of said source of light at a substantially constant distance therefrom.

6. A chamber, having openings in two opposite walls thereof, a source of light therein, and means adapted to move printing-frames past said openings at a predetermined rate.

7. A chamber, a source of light therein, openings in two opposite walls of said chamber, and means adapted to move printing-frames past a predetermined portion of said openings at a predetermined rate.

8. In a device of the class described, a source of light, a printing-frame, a channel, and means adapted to move said frame in said channel into and out of range of said source of light.

9. In a device of the class described, a source of light, a channel, and conveying means in said channel adapted to move a printing-frame therein within and out of range of said source of light.

10. In a device of the class described, a source of light, a printing-frame, a channel, and a belt in said channel adapted to move said frames therein within and out of the range of said source of light.

11. In a device of the class described, a source of light, a printing-frame, means for moving said frame within the range of said source of light at a predetermined rate, a chamber inclosing said source of light, and a lining to said chamber adapted to render the distribution of light more uniform.

12. In a device of the class described, a source of light, a printing-frame, means for moving said frame within the range of said source of light for a predetermined time, a chamber inclosing said source of light, and a lining to said chamber adapted to render the distribution of light more uniform.

13. A chamber having openings in two opposite walls thereof, a source of light therein, means adapted to move printing-frames past said openings at a predetermined rate, and a lining within said chamber adapted to render the distribution of light more uniform.

14. A chamber having openings in two opposite walls thereof, a source of light therein, means adapted to move printing-frames past a predetermined portion of said openings, and a lining within said chamber adapted to render the distribution of light more uniform.

15. In a device of the class described, a source of light, a printing-frame, a channel, means adapted to move said frame in said channel within and out of the range of said source of light, and a lining within a chamber adapted to render the distribution of light more uniform.

16. In a device of the class described, a source of light, a printing-frame, a receptacle having walls of approximately the height of said frame, and means for moving said frame past said source of light and depositing the same in said receptacle.

17. In a device of the class described, a source of light, a printing-frame, an inclined receptacle having walls of approximately the height of the printing-frame, and means for moving said frame past said source of light and depositing the same in said receptacle.

18. A plurality of sources of light arranged in a straight line, and means adapted to move a printing-frame in a direction parallel to the direction of alinement of said sources of light.

19. A plurality of sources of light arranged

in a straight line, and means adapted to move a printing-frame for a predetermined distance in a direction parallel to the direction of alinement of said sources of light.

20. In a device of the class described, a source of light, a printing-frame, a channel provided with beveled walls, and means adapted to move said frame in said channel into and out of range of said source of light.

21. In a device of the class described, a source of light, a printing-frame, a channel provided with beveled walls, a rear support adapted to rest upon one of the walls of said channel and support said printing-frame, and means adapted to move said frame in said channel within and out of the range of said source of light.

22. In a device of the class described, a source of light, a channel provided with beveled walls, a detachable rear support adapted to rest upon one of the walls of said channel and support a printing-frame, and means adapted to move a printing-frame in said channel within and out of range of said source of light.

23. In a device of the class described, a chamber having an opening in the wall thereof, a source of light therein, a channel beneath said opening, and means in said channel adapted to convey a printing-frame therein past said opening.

24. In a device of the class described, a chamber having an opening in the wall thereof, a source of light therein, a channel beneath said opening, and means in said channel adapted to convey a printing-frame past a predetermined portion of said opening.

25. In a device of the class described, a chamber having an opening in the wall thereof, a source of light therein, a channel beneath said opening, and a belt within said channel adapted to convey said frame therein past a predetermined portion of said opening.

26. In a device of the class described, a chamber having a horizontal opening in the wall thereof, a source of light therein, a channel beneath said opening, and means in said channel adapted to convey a printing-frame therein past a predetermined portion of said opening.

27. In a device of the class described, a chamber having openings in two opposite walls thereof, a source of light therein, channels beneath said openings, printing-frames, and means in said channels adapted to convey said frames therein past said openings.

28. In a device of the class described, a chamber having openings in two opposite walls thereof, a source of light therein, channels beneath said openings, printing-frames, and means in said channels adapted to convey said frames therein past predetermined portions of said openings.

29. In a device of the class described, a chamber having horizontal openings in two opposite walls thereof, a source of light therein, channels beneath said openings, and means in said channels adapted to convey printing-frames therein past predetermined portions of said openings.

30. In a device of the class described, a chamber having openings in two opposite side walls thereof, a source of light therein arranged parallel to the side walls thereof, channels beneath said openings, and means in said channels adapted to convey printing-frames therein past said openings.

31. In a device of the class described, a chamber having an opening in the side wall thereof, a source of light in said chamber arranged longitudinally thereof, a channel beneath said opening and parallel thereto, a pulley mounted at each end of said chamber, a connection between said pulleys adapted to run in said channel, and a printing-frame adapted to be moved in said channel by said connection past said opening.

32. In a device of the class described, a chamber having an opening in the side wall thereof, a source of light in said chamber arranged longitudinally thereof, a channel beneath said opening and parallel thereto, a pulley mounted at each end of said channel, a connection between said pulleys adapted to run in said channel and move a printing-frame in said channel past a predetermined portion of said opening.

33. In a device of the class described, a chamber having an opening in the side wall thereof, a source of light in said chamber arranged longitudinally thereof, a channel beneath said opening and parallel thereto, a pulley mounted at each end of said chamber, a connection between said pulleys adapted to run in said channel and move a printing-frame therein past a predetermined portion of said opening, a rear support adapted to rest upon said channel and support a printing-frame therein and prevent loss of light through said opening.

34. In a device of the class described, a chamber having an opening in the side wall thereof, a source of light in said chamber arranged longitudinally thereof, a channel beneath said opening and parallel thereto, a pulley mounted at each end of said chamber, a connection between said pulleys and adapted to run in said channel and move a printing-frame therein past a predetermined portion of said opening, and a receptacle into which said frame is adapted to be driven.

35. In a device of the class described, a chamber having an opening in the side wall thereof, a source of light in said chamber arranged longitudinally thereof, a channel beneath said opening and parallel thereto, a pulley mounted at each end of said chamber, a connection between said pulleys adapted to run in said channel and drive printing-frames therein past a predetermined portion of said opening, a rear

support adapted to rest upon said channel and support a printing-frame therein and prevent loss of light through said opening, and an inclined receptacle at the end of said channel.

36. In a device of the class described, a chamber having a graduated opening in the side wall thereof, a source of light in said chamber arranged longitudinally thereof, a channel beneath said opening and parallel thereto, a pulley mounted at each end of said channel, a connection between said pulleys adapted to run in said channel and drive printing-frames therein past predetermined portions of said opening, a rear support adapted to rest on said channel and support printing-frames therein and prevent loss of light through said opening, and an inclined receptacle at the end of said channel.

37. A source of light, a printing-frame, and means for moving said frame within the range of said source of light at a predetermined rate.

38. A source of light, a printing-frame, and automatic means for moving said frame within the range of said source of light at a predetermined rate.

In testimony whereof I affix my signature in the presence of two witnesses.

NEHEMIAH DWIGHT WYMAN.

Witnesses:
H. M. SEAMANS,
L. B. STREVELL.