No. 890,379. PATENTED JUNE 9, 1908.

A. SHERRICK.

PHOTOGRAPHIC DEVELOPING APPARATUS.

APPLICATION FILED AUG. 17, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

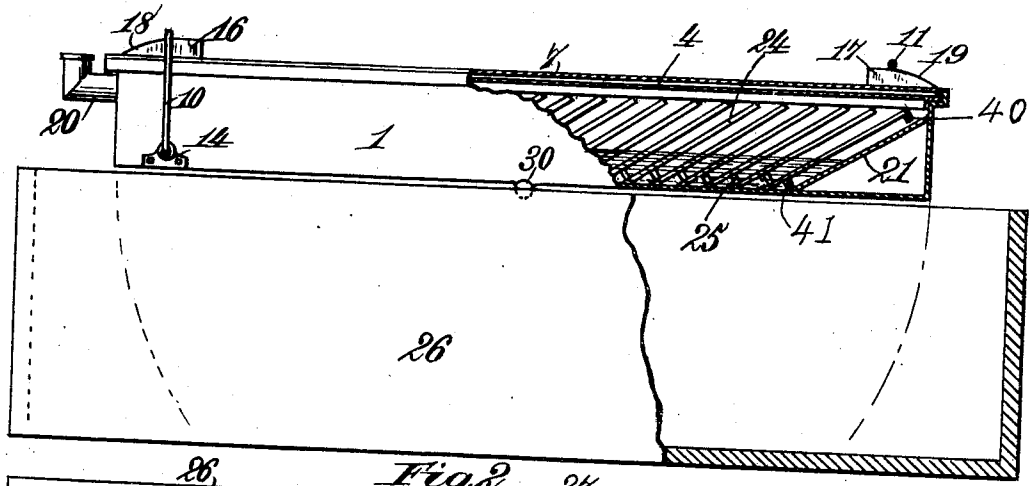



Fig. 2.

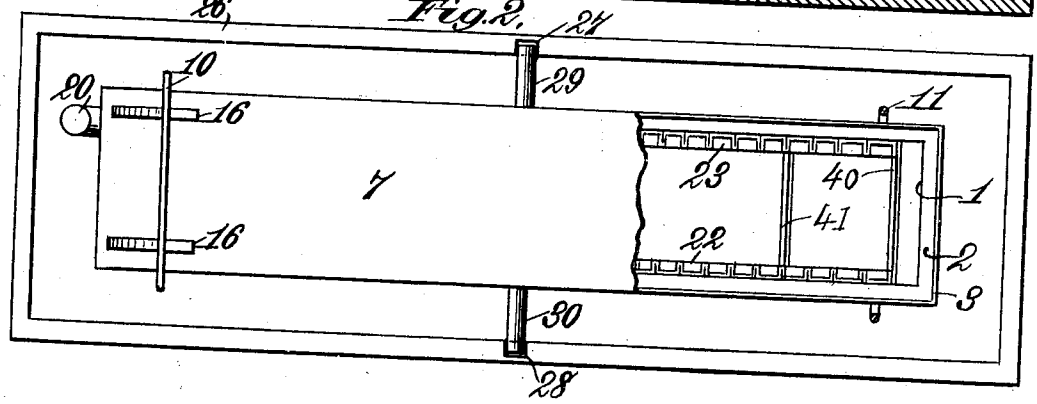
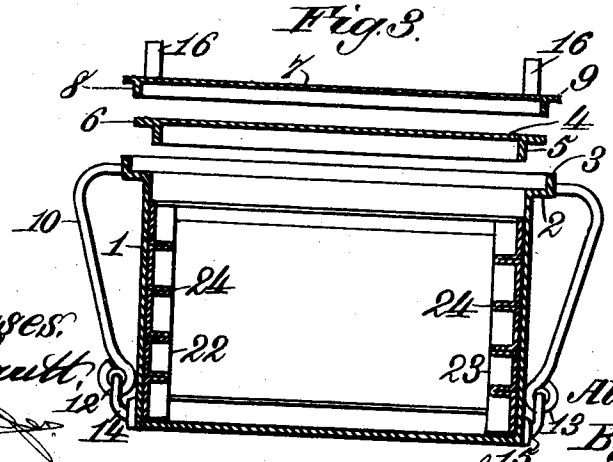



Fig. 3.




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2 SHEETS—SHEET 2.

Fig. 4.

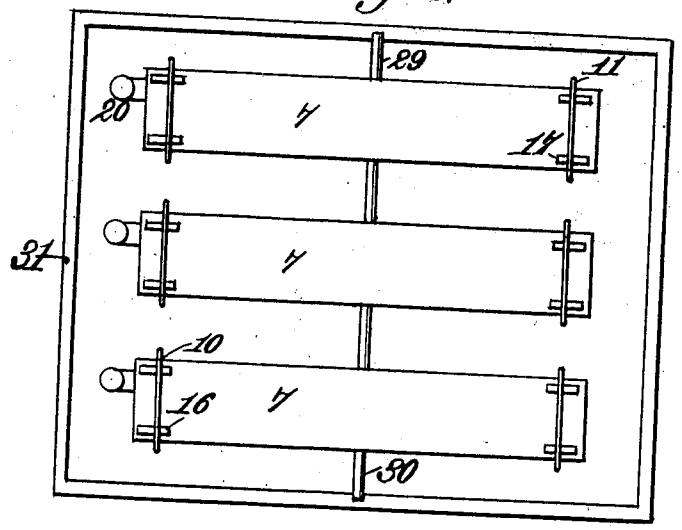



Fig. 5.

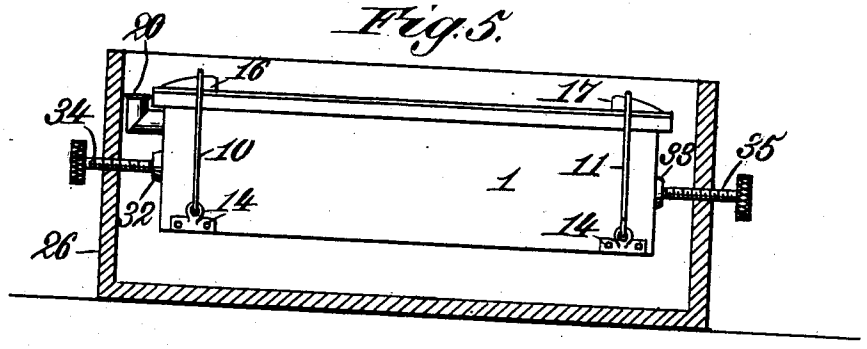
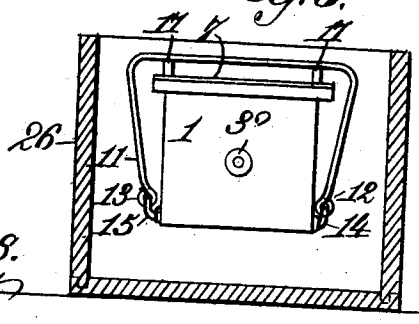



Fig. 6.




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# UNITED STATES PATENT OFFICE.

ALLYN SHERRICK, OF LIMA, OHIO.

## PHOTOGRAPHIC DEVELOPING APPARATUS.

No. 890,379. Specification of Letters Patent. Patented June 9, 1908.

Application filed August 17, 1907. Serial No. 388,993.

*To all whom it may concern:*

Be it known that I, ALLYN SHERRICK, a citizen of the United States, residing at Lima, in the county of Allen and State of Ohio, have invented new and useful Improvements in Photographic Developing Apparatus, of which the following is a specification.

My present invention relates to improvements in photographic developing apparatus, and more especially to the class that is capable of use in day light for developing, fixing and washing plates and other sensitized mediums that have been previously exposed in the camera, and it has for its object to provide an improved device of this character wherein the novel mode of mounting the plates relatively to the tank, and the method of supporting the tank insure a circulation or flow of the solution over every portion of the plate so that the development, fixing and washing thereof is thorough and uniform.

Another object of the invention is to provide a tank of this character wherein the novel manner of mounting the plates therein not only produces better results in the treatment of the plates, but an economy in the quantity of solution required is effected, and the size of the tank having a given capacity is reduced.

Further objects of the invention are to provide a tank or receptacle of this character that is capable of oscillation on either a longitudinal or a transverse axis, as may be desired, and also to provide an improved cover which is both light and liquid tight, so that all the operations of developing, fixing and washing may be accomplished in daylight except loading, which may be readily done in the dark room, and there is no danger of spilling the solutions.

To these and other ends, the invention consists in certain improvements, and combinations and arrangements of parts, all as will be hereinafter more fully described, the novel features being pointed out particularly in the claims at the end of the specification.

In the accompanying drawings:—Figure 1 is a side elevation of a developing tank constructed in accordance with the present invention, the developing tank being mounted in a frame or receptacle and parts being broken away to illustrate the interior construction of the tank. Fig. 2 is a plan view of the tank shown in Fig. 1. Fig. 3 represents a transverse section of the tank, the cover being shown removed. Fig. 4 is a plan view of a set of developing tanks constructed in accordance with the present invention and operatively connected for simultaneous movement. Fig. 5 shows the tank mounted for oscillation on a longitudinal axis, and Fig. 6 represents a transverse section of a tank, mounted as shown in Fig. 5.

Similar parts are designated by the same reference numerals in the several figures.

The developing apparatus shown in the present embodiment of my invention comprises generally a tank 1, that is substantially rectangular and may be of any suitable dimensions that will be determined according to the size of the plates or other sensitized mediums that are to be treated therein and also according to the capacity, and it may be composed of aluminum or other suitable material, the top of the tank being open and adapted to receive a suitably constructed lid which is preferably capable of excluding light from the sensitized plates within the tank and will prevent leakage of the solution during the movements of the tank.

In the present instance, the upper edge of the tank is provided with an out-turned flange 2, the peripheral edge of which is directed upwardly to form a rim 3. Coöperating with the rim and flange is a double cover composed of an inner member 4 and an outer member 7, the former having a down-turning flange 5 which is adapted to fit within the sides of the receptacle or tank, and a peripheral rim 6 thereon is arranged to enter within the rim 3 of the tank and rest upon the flange 2 thereon. The upper member 7 of the cover is similarly provided with a down-turned flange 8 which is adapted to snugly fit within the up-turned rim 3 on the tank and bear upon the upper side of the out-turned rim 6 of the lower cover member, thereby serving to retain the latter in place, an out-turned rim 9 on the upper cover member being arranged to engage the upper edge of the up-turned rim 3 on the tank.

In order to prevent accidental displacement of the cover members during the movements of the tank, and to insure a firm seating that will prevent leakage of light or liquid, it is preferable to provide suitable cover retaining devices, those shown in the present instance comprising loops or bails 10 and 11 that are pivoted to the tank at points in proximity to its longitudinal ends, the intermediate portions of the bails being arranged to swing over the respective ends of the cover

members. The bails in the present instance are provided at their free ends with eyes 12 and 13 which coöperate with suitable pivot members 14 and 15 secured to the opposite sides of the tank, and in order to insure a firm closing of the cover, it is preferable to provide pairs of cams 16, 17 which are arranged on the upper side of the upper cover member and have inclined surfaces 18 and 19 which coöperate with the respective bails as the latter are moved into operative position, the inclined surfaces of the cams causing the cover members to obtain a firm seating on the tank.

The developing, fixing and washing solutions are preferably introduced into and discharged from the tank through a spout 20 which is preferably arranged at one end of the tank and has an angle-shaped bend therein to prevent the passage of light, the spout shown in the present instance being in the shape of an elbow with its outer end turned upwardly so as to facilitate the introduction of the solution or liquid in the receptacle and to prevent its accidental spilling. In order to economize in the quantity of solution required in the treatment of the photographic materials, it is preferable to provide an inclined partition 21 which extends across the tank and serves to divide off the corner thereof.

The plates or other sensitized mediums are supported within the tank in a novel manner, that is to say, they are inclined relatively to the plane of the bottom of the tank, the plates in the present instance being supported on sets of racks 22 and 23 which are arranged on the opposite longitudinal walls of the tank and are spaced at suitable intervals longitudinally thereon, the racks being composed of rows of ribs 24 which extend diagonally from the upper edge of the tank downwardly to a point in proximity to the bottom thereof, the lower end of each rib being turned laterally to form a rest or support 25 for the plate or plates. These ribs may be spaced at any suitable distance relatively to one another so that they may accommodate either a single plate or a plurality of plates in the channels which are formed between them. These racks may be either secured permanently within the tank, or they may be removable, as may be desirable, those shown being made up of plates of zinc, aluminum, or other suitable metal corrugated to form the plate engaging ribs, and they are adapted to removably fit within the sides of the tank, the plates being connected by the pairs of upper and lower spacing bars 40 and 41 which serve to support the plates in proper relation while they are within the tank, and enable the racks to be bodily removed therefrom so that not only can all the plates be removed at one time, but the interior of the tank is unobstructed and then adapted to receive uncut films. It is preferable to so arrange the plate racks that the lower ends thereof are directed toward that end of the tank at which the spout is located, for the reason that when so arranged, the drainage of the solution from the plates is facilitated.

Any suitable frame or receptacle may be provided to act as a support within which the tank oscillates, that shown in Figs. 1 and 2 being composed of a rectangular box 26, which is open at its upper side and provided with oppositely arranged bearings 27, 28 to coöperate with a pair of pivot pins or trunnions 29, 30 which project in alinement from the opposite longitudinal sides of the tank at a point midway of the length thereof and provide a transverse axis about which the tank may oscillate during the developing, fixing and washing operations. When so mounted, the ends of the tank will be alternately elevated and depressed, inducing a flow of the solution from one end of the tank to the other, the plate racks being so mounted therein that the lower edges of the plates will be spaced above the bottom of the tank a distance sufficient to permit of the thorough circulation of the solution. However, the tank will be filled to approximately one-third of its depth with the solution, so that the lower edges or portions of the plates are submerged therein, and as that end of the tank carrying the spout is elevated, the solution will flow towards the opposite end of the tank, those portions of the plates submerged in the solution acting as deflectors, and thereby diverting the solution so that it will flow in a film over each plate, passing over the upper edges thereof and returning to the bottom of the tank when the latter is tilted in an opposite direction, the thorough circulation of the solution insuring uniform chemical action on the plates.

In using the tank for commercial purposes, a large number of plates may be treated simultaneously by arranging the tanks in a multiple set, such as that shown in Fig. 4, the pivots or trunnions of a plurality of tanks being joined so as to give a simultaneous tilting movement to all the tanks in the set, a single receptacle or frame 31 serving to support the several tanks.

In some cases it may be desirable to oscillate or tilt the tank on a longitudinal axis, and in order that this result may be accomplished, it is preferable to provide the longitudinal ends of the receptacle with suitable bearings 32 and 33 which are adapted to coöperate with the inner ends of a pair of pivot pins 34 and 35 which extend through opposite walls of the receptacle 26, such a construction permitting a tilting movement of the tank on a longitudinal axis.

A developing tank constructed in accordance with the present invention is capable of being manipulated during developing, fixing

and washing of the negatives in daylight, it being necessary to use the dark room only in loading the tank with the plates, and this may be accomplished easily by slipping the plates into the channels formed between the inclined ribs which constitute the plate supporting racks, the cover members being replaced and fastened before the tank is taken from the dark room, and in practice the inclined arrangement of the plates relatively to the bottom of the tank insures a thorough circulation of the solution over the plates, and as it is necessary to only partly fill the tanks with the solution, an economy in the amount of the solution required is effected. Moreover, the thorough circulation of the solution stimulates chemical action to such an extent as to materially reduce the time required in the developing and fixing operation.

It will be understood of course that while the tank shown in the present embodiment of the invention is particularly adapted for use in the treatment of photographic plates wherein the glass provides a rigid backing or support for the film, the invention is not so limited, as the usual flexible films that have been previously cut according to the different exposures may be readily inserted into the channels provided for the plates, and the uncut films having a plurality of exposures thereon, may be developed and otherwise treated in the usual way, that is to say, by dipping portions of their lengths into the tank, the plate supporting racks preferably projecting only partially across the tank so that they may not obstruct the tank when so used in cases where the racks are permanently fastened within the tank, and in those cases wherein the racks are detachable, they may be readily removed to accommodate the films.

I claim as my invention:—

1. A photographic developing tank having means therein extending continuously from the upper part to approximately the bottom of the tank for supporting the sensitized medium at an incline relatively to the plane of the bottom of the tank.

2. A photographic developing tank having means therein extending continuously from the top to approximately the bottom of the tank for supporting the sensitized medium at an incline relatively to the plane of the bottom of the tank and with the lower edge of the said medium spaced above the bottom to provide a passage for the solution.

3. In a photographic apparatus of the character described, the combination with a tank for the solution, of sets of racks having inwardly projecting ribs extending continuously from the upper part to approximately the bottom of the tank and forming channels spaced longitudinally of the tank and lying in planes inclined relatively to the plane of the bottom of the tank and adapted to receive the sensitized medium.

4. In a photographic apparatus of the character described, the combination with a suitable tank for the solution, of sets of plate receiving racks arranged in the opposite longitudinal walls of the tank, each rack being composed of a set of inwardly projecting ribs extending continuously from the top to a point adjacent to the bottom of the tank and having laterally turned portions forming rests for spacing the lower edges of the plates above the bottom of the tank.

5. In a photographic developing apparatus, the combination with a tank for the solution, of supporting racks for the sensitized medium extending partially across the interior of the tank and continuous from the top to approximately the bottom of the tank and forming a set of channels inclined relatively to the plane of the bottom of the tank.

6. A light-tight photographic plate developing tank having means for supporting a row of plates in inclined position and spaced longitudinally of the tank, the upper and lower horizontal edges of the plates being spaced slightly from the corresponding adjacent walls of the tank to provide narrow passages for conducting the developing solution longitudinally of the tank, the inclined spaces between the plates being arranged to receive the solution from said longitudinal passages and to pass it over the plates in the form of films.

7. A photographic developing apparatus comprising a tank provided with a liquid and light-tight cover, means for supporting a row of longitudinally spaced plates in inclined position and for sealing the vertical edges of the plates to the passage of fluid between them and the sides of the tank, the plates being supported with their upper and lower edges slightly spaced from the top and bottom of the tank to form narrow longitudinal fluid passages, and means for pivoting the tank on a transverse axis to induce a flow of solution longitudinally through said passages and obliquely through the spaces between the plates during the rocking movements of the tank.

8. In a photographic developing apparatus, the combination with a liquid and light-tight tank for the solution, and means for supporting it for movement on a transverse axis, of means for supporting a row of sensitized mediums spaced longitudinally and extending transversely of the tank and in inclined relation to the bottom thereof, said supporting means extending continuously from the upper portion to approximately the bottom of the tank to seal the vertical edges of the plates to the passage of the solution.

9. In a photographic developing apparatus, the combination with a liquid and light-

tight tank for the solution, and means for supporting it for movement on a transverse axis, of a pair of racks arranged on the longitudinal walls of the tank and extending continuously from the upper portion to approximately the bottom thereof, the racks having plate receiving grooves inclined relatively to the plane of the bottom of the tank to receive a series of plates standing on edge and spaced above the said bottom to form a return passage for the solution below the plates.

10. The combination with a tank having an out-turned flange on its upper edge, and an upturned rim surrounding the flange, of a lower cover member having a down-turned flange adapted to enter within the sides of the tank, and a rim adapted to enter within the rim of the receptacle and coöperate with the flange of the tank and an upper cover member having a downturned flange bearing upon the lower cover member and centered within the upturned flange on the tank.

11. The combination with a tank having an out-turned flange on its upper edge, and an upturned rim surrounding the flange, of a cover for closing the tank embodying a member having a flange to enter within the sides of the tank and a rim to enter within the rim of the tank and coöperate with the flange thereof, a second cover member having a down-turned flange adapted to fit within and coöperate with the rim of the tank and having a peripheral rim adapted to overlap and coöperate with the upper edge of the rim on the tank, and fastening devices for securing the cover members in coöperative relation with one another and with the tank.

12. In a photographic developing apparatus, the combination with a tank for the solution, and a light and liquid excluding cover fitting the tank, of means for detachably locking the cover upon the tank embodying a pair of bails pivotally attached to one of the parts or points in proximity to its ends, and cams on the other part having inclined surfaces arranged to coöperate with the said bails.

13. In a photographic developing apparatus, the combination with a tank for the solution, of a plate supporting device embodying a pair of oppositely arranged racks removably fitting within the tank and having sets of inwardly projecting ribs extending continuously from the upper portion to approximately the bottom of the tank and forming plate receiving channels, and cross pieces connecting the racks and serving to retain them in proper relation.

14. In a photographic developing apparatus, the combination with a tank for the solution, of a pair of plate supporting racks adapted to fit within the tank, each rack being composed of a plate having a set of corrugations extending continuously from the upper portion to approximately the bottom of the tank in an inclined direction relatively to the bottom of the tank and forming a plurality of plate-receiving channels.

15. A tank for developing photographic plates having racks arranged on the opposite sides thereof and provided with corrugations extending in slanting relation to the bottom of the tank for supporting a series of plates in inclined position to form a series of inclined passages for the developing solution, and a liquid and light tight cover fitting the top of the tank and spaced above the upper edges of the plates for confining the developing solution within the tank and for excluding light during the developing operation.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ALLYN SHERRICK.

Witnesses:
J. F. EMANS,
C. F. HUGHES.