

E. S. GERHARD.
 PHOTOGRAPHIC PLATE AND PAPER DEVELOPING MACHINE.
 APPLICATION FILED JUNE 20, 1912.

1,061,667.

Patented May 13, 1913.

2 SHEETS—SHEET 1.

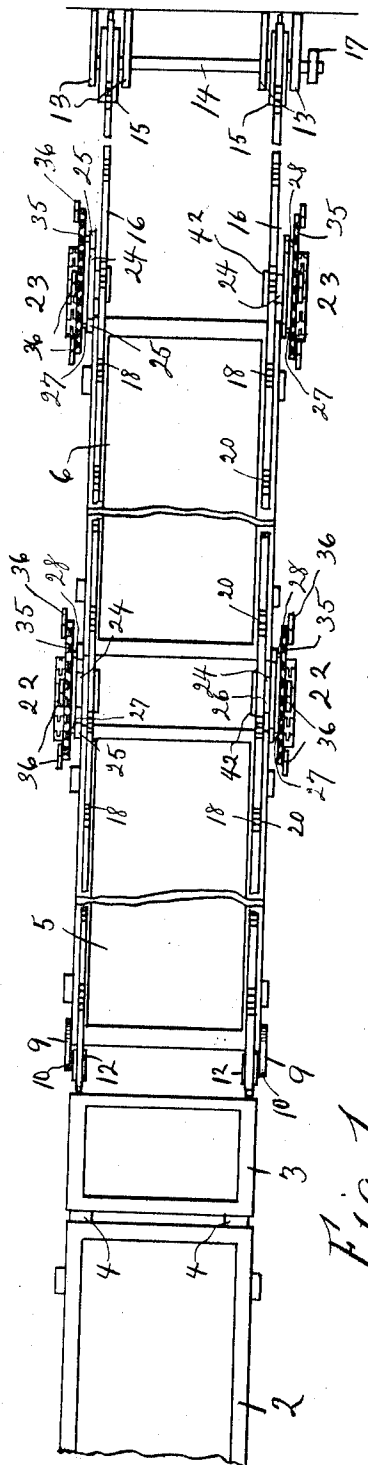


Fig. 1.

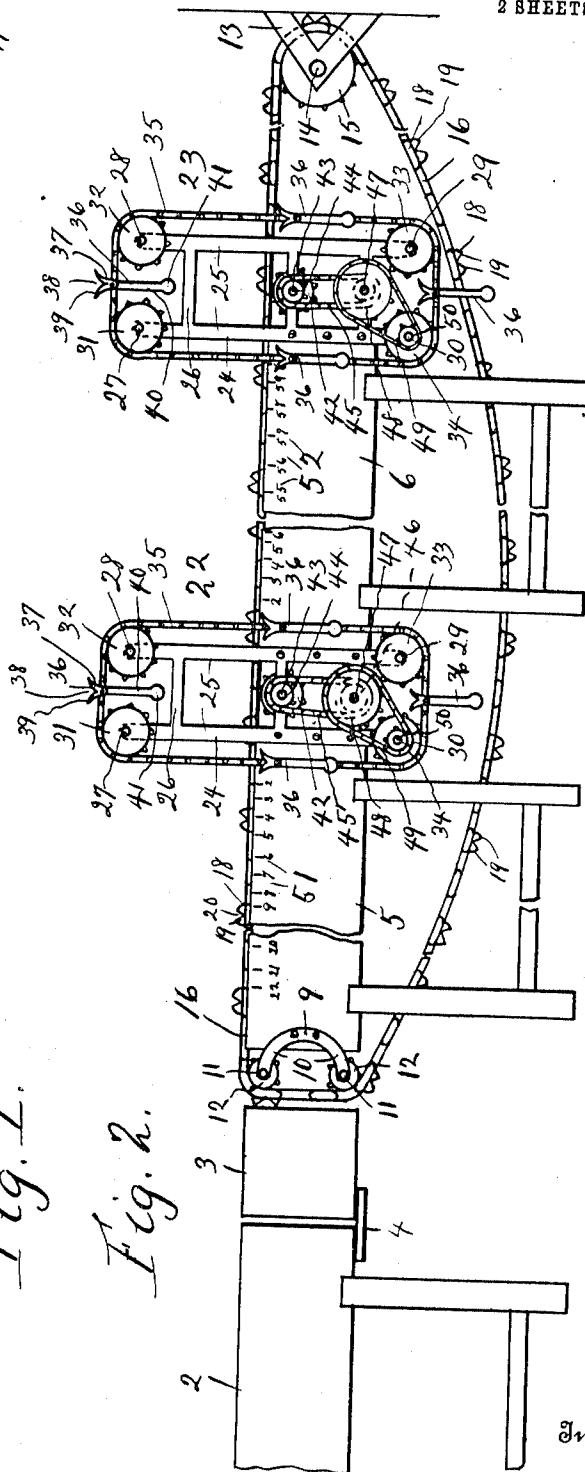


Fig. 2.

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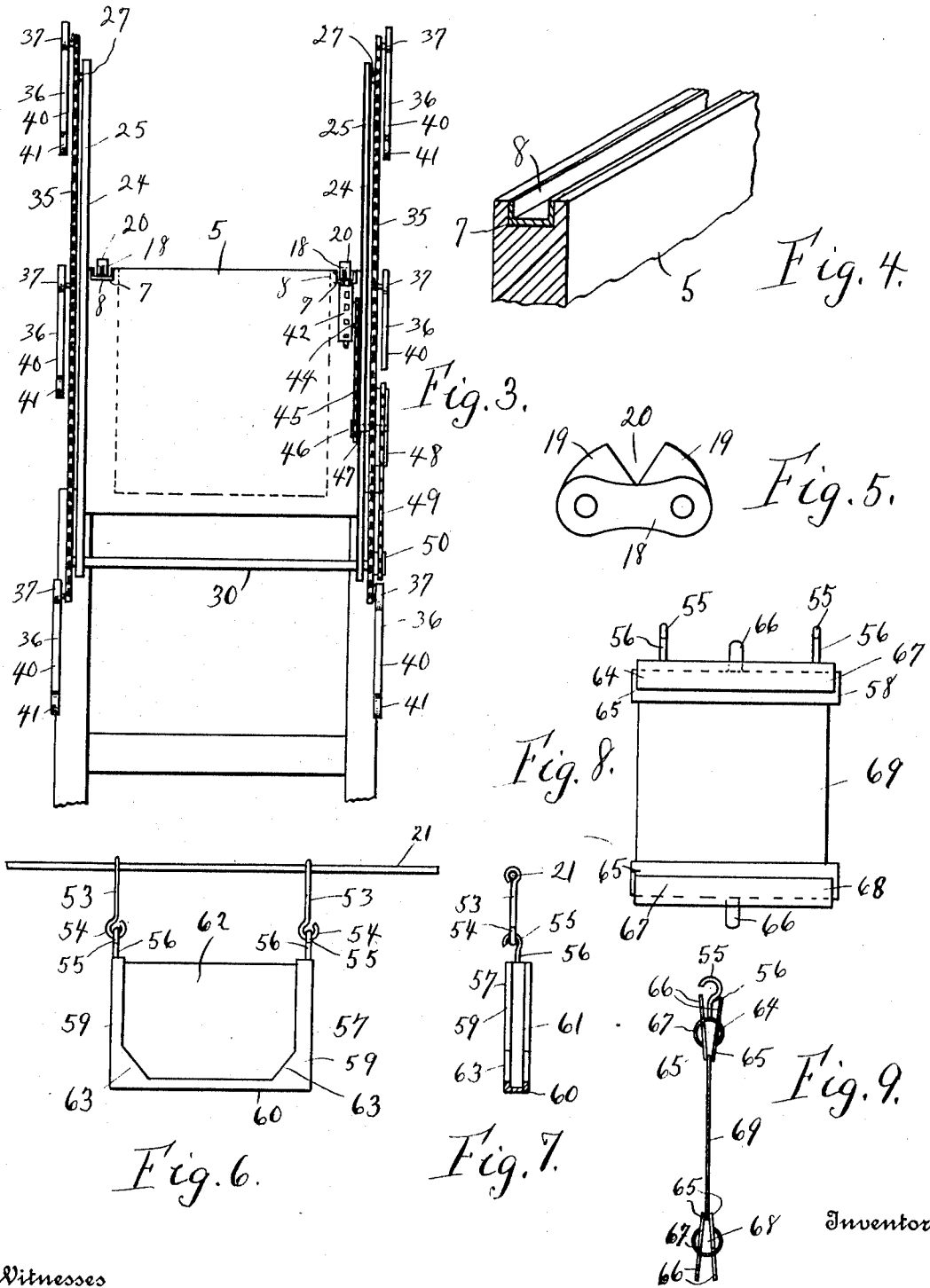
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 By W. B. Williamson
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UNITED STATES PATENT OFFICE.

ELMER S. GERHARD, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO
J. HARRY EVANS, OF PHILADELPHIA, PENNSYLVANIA.

PHOTOGRAPHIC PLATE AND PAPER DEVELOPING MACHINE.

1,061,667.

Specification of Letters Patent.

Patented May 13, 1913.

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To all whom it may concern:

Be it known that I, ELMER S. GERHARD, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Photographic Plate and Paper Developing Machines, of which the following is a specification.

My invention relates to new and useful improvements in photographic plate and paper developing machine, and has for its object to provide a device of this character whereby the photographic plate or paper after being developed, may be placed in the fixing bath and retained there the proper length of time to complete the operation, after which said photographic plate or paper will be removed from the fixing bath by suitable lifting and transferring mechanism and transferred to the washing bath where said photographic plate or paper will remain the desired length of time to thoroughly wash them, after which said photographic plate or paper will be removed from the bath by another lifting and transferring mechanism and transferred to a conveyer from which they will hang to be dried by the atmosphere. Said conveyer passing over the tanks holding the afore-said baths and carrying said photographic plate or paper through said baths.

A further object of the invention is to provide a number of suitable tanks some of which must be in alinement while all of said tanks are preferably situated in alinement. In combination with a suitable conveying means on which are removably mounted suitable frames for holding the photographic plate or paper in the different baths and conveying said photographic plate or paper through said baths for a suitable length of time said conveying means extending beyond the tanks so that the photographic plate or paper may be carried through the atmosphere and dried by natural or artificial means.

With these ends in view, this invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains, may understand how to make and use the same, I will

describe its construction in detail referring by numeral to the accompanying drawing forming a part of this specification, in which—

Figure 1, is a plan view of my photographic plate and paper developing machine, a portion of one of the tanks being broken away. Fig. 2, a side elevation thereof. Fig. 3, an enlarged end view of one of the tanks showing the lifting and transferring mechanism applied thereto. Fig. 4, an enlarged perspective view of a portion of the upper edge of one of the side walls. Fig. 5, an enlarged side elevation of one of the links of the conveyer chain. Fig. 6, an enlarged side elevation of a frame for holding the photographic plate. Fig. 7, a vertical sectional view thereof. Fig. 8, a side elevation of a modified form of frame for holding photographic paper, and Fig. 9, an end view thereof.

In carrying out my invention as here embodied 2 represents the developing tank adapted to hold a suitable developer or developing liquid having situated adjacent thereto, a rinsing tank 3, and made to be carried by suitable brackets 4 fastened to the developing tank 2. Adjacent the rinsing tank is situated the fixing bath tank 5, and in alinement with this last named tank is situated a washing tank 6, one end of which is spaced apart from the adjacent end of the fixing bath tank 5. The upper edges of the sides of said tanks 5 and 6 are provided with longitudinal grooves 7, in which are mounted metallic U shaped tracks 8. On the outer end of the fixing bath tank, or that end lying adjacent the developing tank, are mounted the oppositely disposed brackets 9, each having two arms 10 one above the other extending beyond the tank and in said arms are journaled the shafts 11 on which are mounted the sprocket wheels 12. At some suitable point such as the wall of the room in which the machine is placed in alinement with the tanks 5 and 6 are mounted the brackets 13 in which is journaled the shaft 14 carrying the two oppositely disposed sprocket wheels 15 over each of which runs a suitable conveyer preferably chains 16, said conveyer running through the bracket 8 on each tank over the sprocket wheels 12, then beneath the tanks to the starting point. The shaft 14 is provided with suitable means such as a

pulley 17, whereby connection may be made with a suitable source of power such as an electric motor, not shown. The conveying chains 16 are provided with a number of links 18 each having projecting therefrom an extension 19 in which is formed the notch 20 for the reception of the rod 21 adapted to carry a plate or paper holding device as will be hereinafter described.

- 10 Between the tanks 5 and 6 and at the opposite end of the tank 6, are mounted the elevating and transferring devices 22 and 23 each of which are identical and therefore, the description of one will be the
15 description of the other. To form one of the elevating and transferring devices, it is necessary to employ two oppositely disposed similar mechanisms and one of these mechanisms is placed at each side of the tanks.
- 20 Each member of the elevating and transferring devices comprises a frame 24 formed of two parallel uprights 25 braced by suitable cross pieces 26, the ends of said uprights acting as bearings for the axles 27, 28,
25 29 and 30 of the sprocket wheels 31, 32, 33 and 34 over which runs a chain 35 having pivoted at suitable predetermined points on the outer edge thereof, a number of pick-ups 36 each consisting of a head 37 having a
30 notch or mouth 38, the side walls of which are arcuate as at 39, a pendulum arm 40 and a pendulum 41 whereby each of said pickups will remain in a vertical position as they travel around the circuit. The chain 35 carrying
35 the pickups 36 has motion imparted thereto from the conveying chains 16 through a suitable train of gears which has the sprocket 42 mounted upon the shaft 43 which is journaled in the frame 24, said sprocket wheel
40 42 co-acting with the conveying chains 16. On the shaft 43 is mounted a second sprocket wheel 44 over which runs a chain 45 of a sprocket wheel 46 mounted upon the shaft 47 journaled in the frame 24, said shaft
45 carrying a second sprocket wheel 48 over which runs a chain 49 to the sprocket wheel 50 mounted upon the shaft 30, said shaft preferably running through to the adjacent oppositely disposed member of the elevating and transferring device causing the
50 sprocket wheel 41 thereof to revolve for imparting motion to the chain 35 of the last named member.

- From this description it will be seen that
55 it is unnecessary to use a train of gears or other similar device for imparting motion to the chain 35 on each of the members forming one of the elevating and transferring devices. The train of gears is properly
60 timed in relation to the conveying chains 16 so that one of the pickups will pass each link 18 of the conveying chain as said links pass the elevating and transferring mechanism. The tanks 4 and 5 may each be provided with a set of indication marks such

as numerals 51 and 52, each set of indication marks beginning at that end of the tank to which the elevating and transferring device 22 is secured and these indication marks preferably designate the space of
70 time such as minutes, taken for one of the links 18 to travel from one indication mark to the other. The rod 21 carries a pair of spaced depending arms 53 each having an
75 eye 54 formed from the end thereof with which co-acts a hook 55 formed on each of the upwardly projecting arms 56 carried by either of the holding frames 57 and 58. The holding frame 57 is especially adapted for use with photographic plates and comprises
80 two side members 59 and a bottom member 60, said side and bottom members being preferably formed of channel iron thus forming a groove 61 for the insertion of the plate 62. This frame may be braced in any
85 suitable manner as by angle braces 63. The frame 58 which is adapted for use with photographic paper is formed from a spring clamp 64, comprising two jaws 65 each having a handle 66, said jaws being normally
90 held together by a spring 67. This holding frame carries upwardly projecting arms 56 with hooks 55 similar to those described in connection with the photographic plate holding frame.

In order that the paper may be continually held in the bath while passing there-through, I provide a second spring clamp 68 which is attached to the lower edge of the photographic paper 69, said clamp being similar in all details to the first named clamp except that the arms 56 are dispensed with.

In practice, the photographic plate or paper is placed in the holder designed for the same, after which said holder is mounted upon the arms 53 carried by the rod 21, and said photographic plate or paper then submerged in the developer in the developing tank 2, the operator holding the rod 21 while he proceeds with the developing process thus enabling him to carry on the work without placing his hands in the developer so that his hands are always dry and unstained. After the photographic plate or
115 paper has been developed it is lifted from the developing bath and submerged in the water contained in the rinsing tank 3 where the excess developer is removed. After the photographic plate or paper has been rinsed
120 it is removed from the tank 3 and placed in the fixing bath contained in the tank 5. At this point, the rod 21 is set in the notches 20 of a pair of oppositely disposed links 18 of the conveying chains 16.

If it is desired to have the photographic plate or paper remain in the fixing bath say for twenty minutes, the rod 21 is placed in those links 18 of the conveying chains 16 passing the indication mark 20 at which
130

time the conveying chains will carry the rod 21 with its frame through the fixing bath for twenty minutes, and at the end of this space of time, said rod 21 will have reached the elevating and transferring device 22 where a pair of pickups 36 will engage the ends of said rod, said rod passing in the mouths 38 in the heads 37. The rod will then be elevated by the chain 35 removing the photographic plate or paper from the fixing bath and transfer it to the washing bath contained in the tank 6, said washing bath being clear water preferably in constant circulation.

The elevating and transferring device is so timed that when the pickups carry the rod 21 past that part of the conveying chains 16 running over the tank 6, said rods will enter the notches 20 of one part of the links 18 of the conveying chains 16. The photographic plate or paper is then carried through the washing bath until the rod 21 reaches the second elevating and transferring device 23 where it is removed from the tank 6, elevated and transferred to a portion of the conveying chains 16 outside of the tanks where the water is allowed to drip from the photographic plate or paper for drying them, and if found desirable, artificial means may be utilized such as a fan which is not shown because it is well known and used at the present time. After the photographic plate or paper is dried, the rod 21 is removed from the chains and the plate or paper taken from its frame.

Of course I do not wish to be limited to the exact details of construction as here shown as these may be varied within the limits of the appended claims without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new and useful, is—

1. A photographic developing machine consisting of a plurality of tanks, a number of which are in alinement, a conveyer passing over a number of said tanks, a frame for carrying the photographic plate or paper supported by the conveyer and carried through the tanks thereby, and means for elevating and transferring the frame from one portion of the conveyer to another portion thereof.

2. A photographic developing machine consisting of two tanks in alinement, a pair of conveyer chains running along the upper edges of said tanks, some of the links of said chains carrying means for holding a rod, said rod carrying a holding device, a frame carried by said rod, means for transmitting motion to the conveyer chains and means for transferring the rod from one portion of the chain to another portion thereof.

3. A photographic developing machine consisting of two tanks in alinement, a pair

of conveyer chains running along the upper edges of said tanks, some of the links of said chains carrying means for holding a rod, said rod carrying a holding device, a frame carried by said rod, means for transmitting motion to the conveyer chains, and an elevating and transferring mechanism for transferring the rod from one portion of the chain to another, said mechanism consisting of a pair of oppositely disposed frames, sprocket wheels journaled to said frames, chains passing over said sprocket wheels, pickups pivoted to said chains, means for transmitting motion from one of the conveyer chains to one of the sprocket wheels on one frame and means for transmitting motion from said sprocket wheel to a similar sprocket wheel upon the other frame.

4. A photographic developing machine consisting of two tanks in alinement, a pair of conveyer chains running along the upper edges of said tanks, some of the links of said chains carrying means for holding a rod, said rod carrying a holding device, a frame carried by said rod, means for transmitting motion to the conveyer chains, a pair of elevating and transferring mechanisms for transferring the rod from one portion of the conveying chains to another portion thereof, thereby transferring the photographic plate or paper from one tank to another or from one tank to the atmosphere, each of said elevating and transferring mechanisms consisting of a pair of oppositely disposed frames, shafts journaled in said frame, one of said shafts passing over one frame to the other, sprocket wheels mounted on said shafts, a chain running over the sprocket wheels journaled on each frame, pickups pivoted to each of the chains, each pickup consisting of a notched head, a pendulum arm and a pendulum weight, and means for transmitting motion from one of the conveyer chains to one of the sprocket wheels mounted upon the shaft which is journaled in both frames whereby the chains carrying the pickups are caused to pass the conveyer chains at predetermined time for picking up and delivering the rod carried by the conveyer chains.

5. A photographic developing machine consisting of two tanks in alinement, a pair of conveyer chains running along the upper edges of said tanks, some of the links of said chains carrying means for holding a rod, said rod carrying a holding device, a frame carried by said rod, means for transmitting motion to the conveyer chains, a pair of elevating and transferring mechanisms for transferring the rod from one portion of the conveying chains to another portion thereof, thereby transferring the photographic plate or paper from one tank to another or from one tank to the atmosphere, each of said elevating and transferring mechanisms consist-

ing of a pair of oppositely disposed frames, shafts journaled in said frame, one of said shafts passing over one frame to the other, sprocket wheels mounted on said shafts, a
5 chain running over the sprocket wheels journaled on each frame, pickups pivoted to each of the chains, each pickup consisting of a notched head, a pendulum arm and a pendulum weight, a shaft journaled in the
10 frame, two sprocket wheels mounted on said shaft one of which co-acts with one of the conveying chains, another shaft journaled in the frame, two sprocket wheels mounted thereon, a chain passes over one of the first
15 named sprocket wheels and one of the last

named sprocket wheels, another sprocket wheel mounted upon the shaft which is journaled in both of the frames and another chain running over one of the second named sprocket wheels and the last named sprocket
20 wheel thereby transmitting motion from one of the conveyer chains to the chains which carry the pickups.

In testimony whereof, I have hereunto affixed my signature in the presence of two
25 subscribing witnesses.

ELMER S. GERHARD.

Witnesses:

J. HARRY EVANS,
JOS. M. GARDISER.