J. E. BRYANT.

DEVELOPING TANK.

APPLICATION FILED AUG. 19, 1914.

1,194,707.

Patented Aug. 15, 1916.

2 SHEETS—SHEET 1.

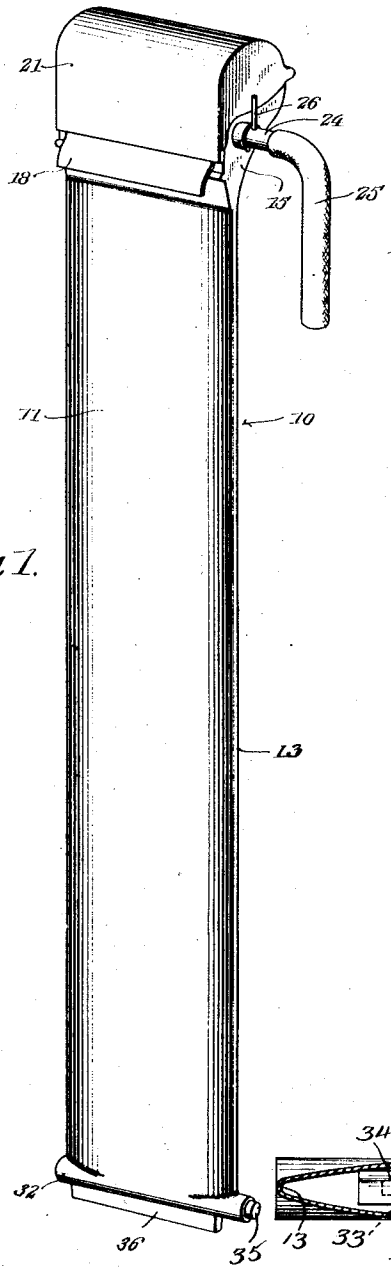


Fig. 1.

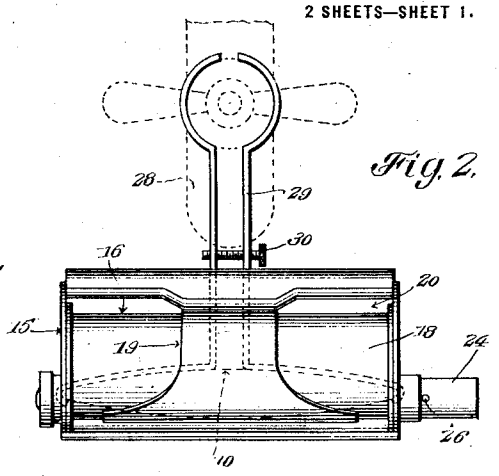


Fig. 2.

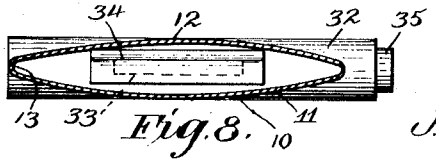


Fig. 8.

Witnesses

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2 SHEETS—SHEET 2.

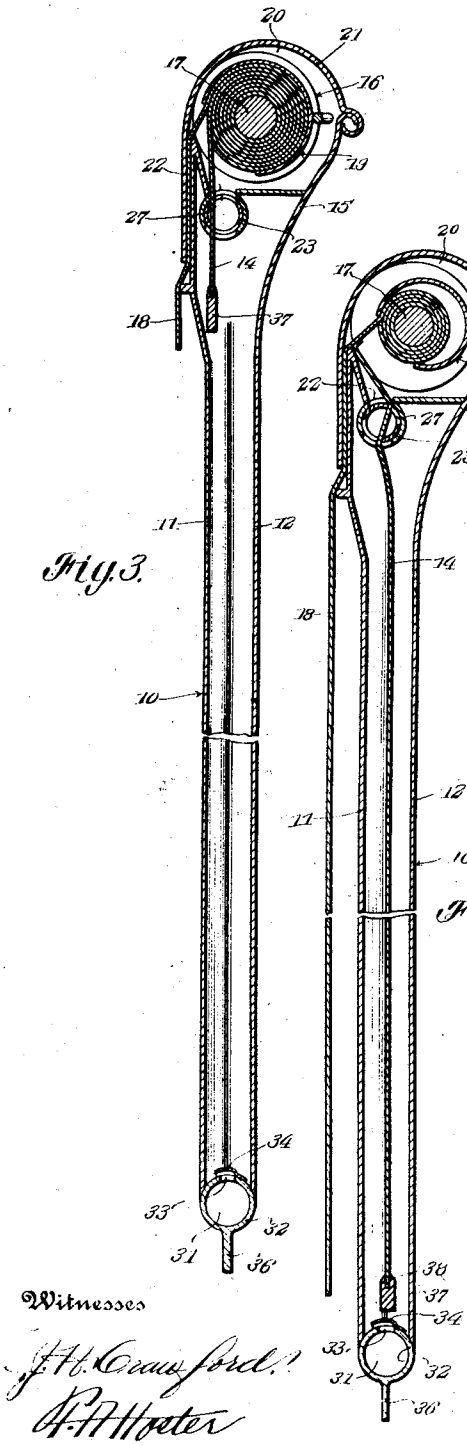


Fig. 3.

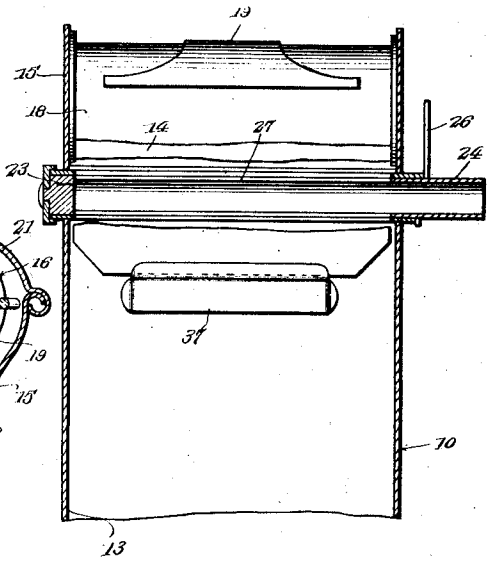


Fig. 4.

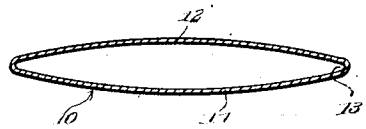


Fig. 6.

Fig. 5.

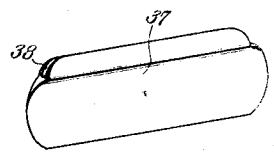


Fig. 7.

Witnesses

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UNITED STATES PATENT OFFICE.

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DEVELOPING-TANK.

1,194,707. Specification of Letters Patent. Patented Aug. 15, 1916.

Application filed August 19, 1914. Serial No. 857,549.

To all whom it may concern:

Be it known that I, JOHN EDWIN BRYANT, a native-born citizen of the United States, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Developing-Tanks, of which the following is a specification.

The invention relates to photography, and more particularly to the developing of films and the like used in photography, and has for an object to provide a simple structure or tank for use in readily and quickly developing the sensitized element with the usual fluids.

The invention contemplates, among other features, the provision of a tank which will take up very little room so that it can be readily carried from one place to another and which can be easily operated on account of its simple construction.

The invention still further contemplates the provision of a developing tank, in the use of which films or the like can be developed in broad daylight without the necessity of first entering a dark room or darkened chamber for the purpose of placing the film in the tank prior to subjecting the same to the action of the developing fluids or chemicals.

Still further objects reside in the provision of a device in which the duplex paper usually surrounding a film roll does not enter the tank with the film, but is removed from the film as the film is advanced into developing position in the tank, thus preventing the discoloration and weakening of the fluids used in the developing process, by the duplex paper which is usually of a red color, and an opaque nature.

Still further objects of the invention reside in the provision of a developing tank of a novel construction whereby the particular configuration of the tank obviates the necessity of using guides or rolls for advancing the film into developing position and whereby the film will have its faces or the portions sensitized and upon which the picture is photographed, spaced from the walls of the developing tank.

Still further objects reside in the provision of a light-tight structure as, for instance, the provision of suitable means movably supported on the tank body for conveying the developing or cleansing fluids to the tank but which, however, are so arranged and constructed that they will prevent the admission of light into the tank during the process of developing the film.

In the further disclosure of the invention reference is to be had to the accompanying drawings, constituting a part of this specification, in which similar characters of reference denote corresponding parts in all the views, and in which:

Figure 1 is a perspective view of the developing tank showing the same arranged in position for developing a film; Fig. 2 is a plan view of the developing tank shown in Fig. 1, with the cover removed, showing the film gripping or holding member and the bracket by means of which the developing tank is supported on the faucet or water supply; Fig. 3 is a vertical transverse sectional view taken through the developing tank; Fig. 4 is a fragmentary vertical longitudinal sectional view taken through the upper portion of the tank; Fig. 5 is a fragmentary vertical transverse sectional view showing the film after the same has been arranged in the tank, with the means for preventing the intrusion of light through the film entrance to the tank; Fig. 6 is a horizontal transverse sectional view taken through the tank body showing the configuration of the body of the tank in cross section; Fig. 7 is a perspective view of the weighted member for advancing the film in the developing tank; and Fig. 8 is a horizontal sectional view taken through the bottom portion of the tank showing the outlet opening.

Referring more particularly to the views, I provide a tank body 10, preferably of an elongated nature and which consists of front and rear walls 11 and 12 bent concave and meeting to provide longitudinal guideways 13, the said front and rear walls being slightly greater in width than the width of the usual film or similar sensitized element, indicated by the numeral 14, so that when the film is advanced in the tank, its longitudinal edges will engage the tank at the points of meeting of the front and rear walls, thus on account of the peculiar construction of the tank in cross section, preventing the film from curling or winding up upon itself or being twisted and also facilitating the advancement of the film in the tank so that the sensitized portions of the film will be held in spaced relation to the front and rear walls as shown.

The tank body terminates at its upper end in a flared head 15 forming a receptacle for the film roll 16 which film roll consists, more particularly, of the usual roller 17 upon which the film 14 is wound, said film being covered and prevented from being light struck by the usual duplex paper or strip 18 and which has its outer end longer than the outer end of the film 14 to completely cover the film when the same is wound upon the roller 17. Mounted to swing upon the head 15 is a film roll gripping member 19 preferably of a spring-like material in which the film is adapted to be placed when the gripping member is swung out of the plane of the head 15, said gripping member adapted to normally lie in the upper portion of the tank body in the chamber formed by the upper bulged portion of the body and which may be termed a film roll receptacle 20. A cover 21 is mounted to swing upon the head 15 to normally close the receptacle 20, the said cover being fashioned and constructed so that when it is in closed position its edges, tightly gripping the head, will prevent the intrusion of light into the receptacle.

The head 15 has an elongated passage 22 communicating with the interior of the tank body 10 and mounted to turn in the passage is a combined light-tight and fluid conveying member or pipe 23 having a projecting end 24 to which is attached a hose 25, a suitable handle 26 being formed or secured to the projecting end 24 whereby the member 23 can be swung into one of two positions. The said member is in the nature of a pipe as mentioned and has a cut away portion 27 formed so that when the member is in closed position it will cut off or close the upper or entrance end of the pipe 23 without, however, closing the lower or exit end of the passage 22 to the tank body. Thus it will be apparent that when the hose 25 is connected to a water supply such as a faucet 28, water can be readily supplied to the interior of the tank body whether the member 23 is in open or closed position, although the same is preferably in closed position to cut off communication between the receptacle 20 and the tank body 10 when it is desired to supply fluid to the tank body. A bracket 29 is connected to the tank body 10 and is preferably adjustable by a screw 30 whereby the bracket can be also attached to the water supply or faucet 28, supplying water to the tank body.

The lower end of the tank body is provided with a transverse passage 31 constituting an outlet for the tank body and secured in said passage is a pipe 32 provided with a longitudinal outlet slot 33 restricted by a canopy 34 so arranged that it will not prevent the exit of fluid from the tank but will, however, prevent the intrusion of light and which, were it admitted to the tank body, would destroy the film to be developed. The outlet passage 31 is normally closed by a suitable cork or stopper 35 and depending from the lower end of the tank body and constituting a continuation of the wall of the outlet passage is a transverse strip constituting a base 36 for the tank body in order that the same can be arranged to repose upon a shelf or the drip board of a sink in the event that the tank is not supported wholly by the bracket 29 or if, when supported by the bracket, it is desired to have the tank repose upon a shelf or board, said base also facilitating the insertion of the stopper 35 into the outlet.

As mentioned heretofore, the film roll consisting substantially of a roller 17, the film 14 and the duplex paper or strip 18, has the free end of the duplex paper or strip projecting beyond the free end of the film proper. Now it will be apparent that when the film roll is arranged upon the roll gripping member 19 and the same is swung into the plane of the tank body so that the roll will lie within the receptacle 20 the free end of the film will project through the passage 22, whereas the duplex paper or strip which projects beyond the free end of the film will pass between the head of the tank body and the free edge of the cover 21 so as to lie exteriorly of the tank body and not extend within the same. The member or pipe 23 is now in open position and prior to placing the cover in closed position on the head and swinging the film on the gripping member into the receptacle, a member 37 in the nature of a weight having a transverse slot 38, is engaged with the free end of the film so that at the moment the film gripping member 19 is swung from a position to one side of the head into the receptacle to lie in the plane of the film tank the free end of the film will, on account of the gravitation of the weight, pass through the passage 22 and depend in the upper end of the tank body 10. Now the operator grasps the projecting end of the duplex paper and pulls downwardly thereon, thus unwinding the film from the roll due to a rotation which will be imparted to the roll by the downward pull exerted on the duplex paper. In this manner, as the film is unwound from the roll, the weight of the member 37 will gravitationally advance the film in the tank and when the end of the duplex paper is reached it will be apparent that the entire film will be depending in the film tank, with the weight lying in the lowermost portion of the tank and adjacent to the outlet thereof. The member or pipe 23 is now moved from an open to a closed position by turning the handle 26, thus preventing the intrusion of light through the passage 22, leading from the head 15 to the interior of

the tank body 10. It will of course be understood that the usual developing fluid is poured into the tank prior to arranging the film therein, the outlet end of the tank body having been previously closed by the cork or stopper 35. When the film has been sufficiently subjected to the action of the developing fluid, the fluid is withdrawn through the outlet passage and which can be opened by removing the cork 35 and the hose is then connected to the faucet or water supply, thus permitting a supply of clean water to pass into the tank body and exert a cleansing action on the film for the purpose of removing any superfluous developing fluid in the tank or upon the film. When this has been accomplished, the water being drained from the tank body through the outlet passage thereof, the cork 35 is again applied to the outlet opening and the fixing solution is then poured into the tank body through the pipe 23. When the fixing solution has properly acted upon the film to fix the negative which has now been produced this solution is drawn off from the tank body in the same manner as the water and the developing solution, and the film is then again subjected to the cleansing action of clean water carried through the hose or pipe 23 into the tank body 10. The member or pipe 23 can now be swung into open position, thus permitting the withdrawal of the film from the tank body after the cover has been thrown into open position and the film, still carrying the weighted member 37, can be hung up to dry, said member, on account of its weight, preventing the film from coiling or twisting about itself.

As mentioned heretofore, the particular configuration of the tank body and which in cross section is somewhat elliptical, causes the elliptical edges of the tank body to form guideways for the proper advancement of the film in the tank body whereby the sensitized faces of the film will be held in spaced relation to the walls of the tank body. Furthermore, the duplex paper which ordinarily and in many developing tanks, is admitted into the tank body with the film, thus causing the discoloration of the developing fluid and weakening the same so that it cannot properly act upon the film, is in this instance retained exteriorly of the tank body and is the means for advancing the film into the tank body in conjunction with the weighted member connected to the free end of the film.

From the foregoing description it will be apparent that the developing tank described consists of few and simple parts, can be cheaply manufactured and readily operated by the amateur photographer for the reason that its use embodies merely a systematic procedure in the developing process and which, combined with care on the part of the operator, prevents the film from being light-struck or subjected to frictional contact with the developing tank body.

It will be particularly noted by referring to the drawings and to the description herein that when the duplex paper or wrapper of the film is withdrawn exteriorly of a receptacle, thus advancing the film into the tank body, the said duplex paper or wrapper is drawn in the line of direction of advancement of the film in the tank body, or, in other words, the duplex paper or wrapper is drawn longitudinally to the tank body and in the direction of the lower end thereof. This insures the positive advancement of the film into the tank body and the proper unwinding of the film from the film roll, thus making the action in drawing the film into the film body by the withdrawal of the duplex paper, one of a smooth and even nature in that there will be no tendency of the duplex paper or wrapper to catch and prevent the proper advancement of the film into the tank body. This feature is also of value in instances where there is not very much room as in small compartments and wherein there would not be sufficient room to draw the wrapper or duplex paper in a direction opposed to the line of direction of the film as it is advanced into the tank body, while at the same time the drawing of the duplex paper or wrapper in the same direction as the advancement of the film into the tank body reduces greatly the friction between the film and wrapper and between those parts component to the film and duplex paper or wrapper.

As mentioned heretofore, the cross sectional shape of the tank body is of vital importance in insuring the proper arrangement of the film therein in order to further the developing process, and to this end the tank body in cross section is of a lenticular shape, whereby the vertical lines of connection or joints of the front and back of the tank from guides for the film and not only prevent the film from wabbling, but also hold the sides or faces of the film from contact with the sides of the tank. This construction dispenses with the usual vertical guideways that are ofttimes independently secured in developing tanks and other similar articles, and the tank body, therefore, on account of its lenticular shape in cross section, provides a structure which can be cheaply manufactured; which will present a neat and effective appearance and which contemplates the important function of properly supporting the film in the tank so that when water or some other fluid is introduced into the tank it will flow down both faces of the film and the faces of the film will not come in contact with the sides of the tank.

It will of course be understood that when the developing and fixing fluids are poured

into the tank, they are preferably poured through a suitable funnel (not shown) arranged to communicate with the member 23.

Having thus described my invention, I claim:

1. A device of the kind described, consisting of a tank body, said tank body being of an increased width at its upper end, a roll gripping member consisting of a spring mounted at the upper enlarged end of said tank body, the tank body having a continuously flat wall at its upper end, said wall being returned inwardly and downwardly of said tank body to form a rounded edge, an exteriorly and integrally formed shoulder extending at the lowest part of said flat wall, a hinged cover at the upper end of said tank body having an outer flat wall adapted to extend in spaced parallel relation to said first named flat wall in spaced relation from said shoulder, a roll carrying the laminations of a film, said roll being engaged in said flat spring, with one of the laminations of said film passing snugly between said flattened walls and being deflected by said shoulder to hang in spaced relation from said tank body exteriorly thereof, said other lamination passing over said rounded edge, and a weight secured to the edge of said second lamination adapted to descend in said body as said other lamination descends.

2. In a device of the class described, in combination a tank body, a transversely disposed tube secured at the lower end thereof, an elongated web formed integrally upon said tube and forming a rest therefor, said tube having a restricted port communicating with said tank body, and a member secured upon an upper part of said tube within said tank body and having a portion extending over said port in spaced relation from said tube whereby to prevent access of light in said tank body, and a plug engaging said tube to close the same.

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

JOHN EDWIN BRYANT.

Witnesses:
JAMES R. WILD,
GRACE M. BRYANT.