July 23, 1929. A. LANGSNER 1,722,100

DEVELOPING APPARATUS

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Fig. 1.

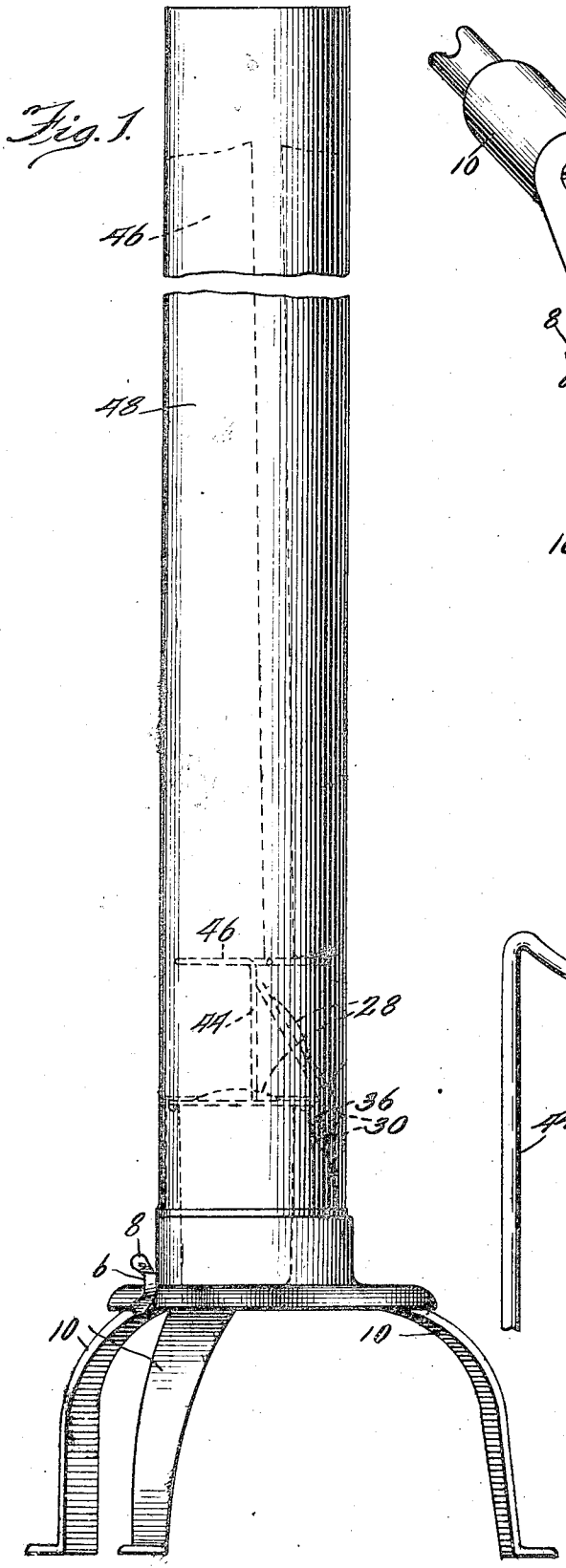



Fig. 2.

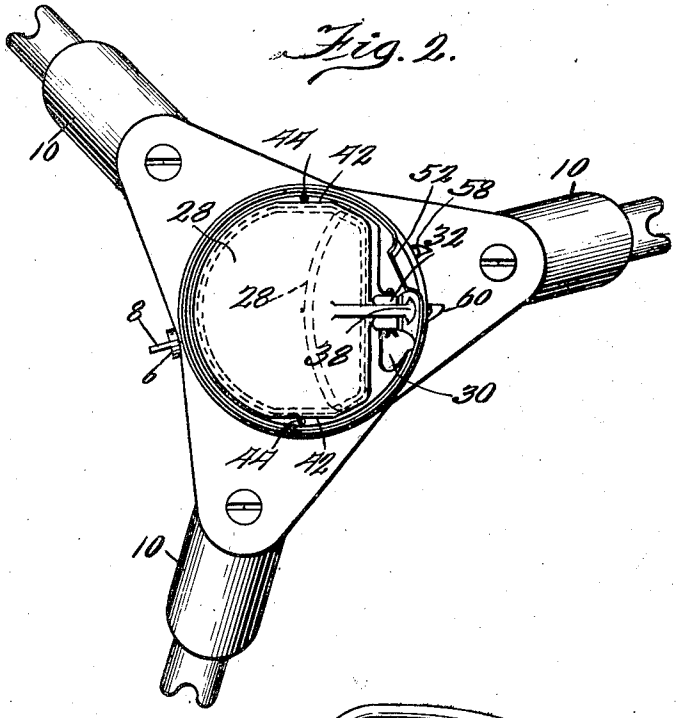



Fig. 7.

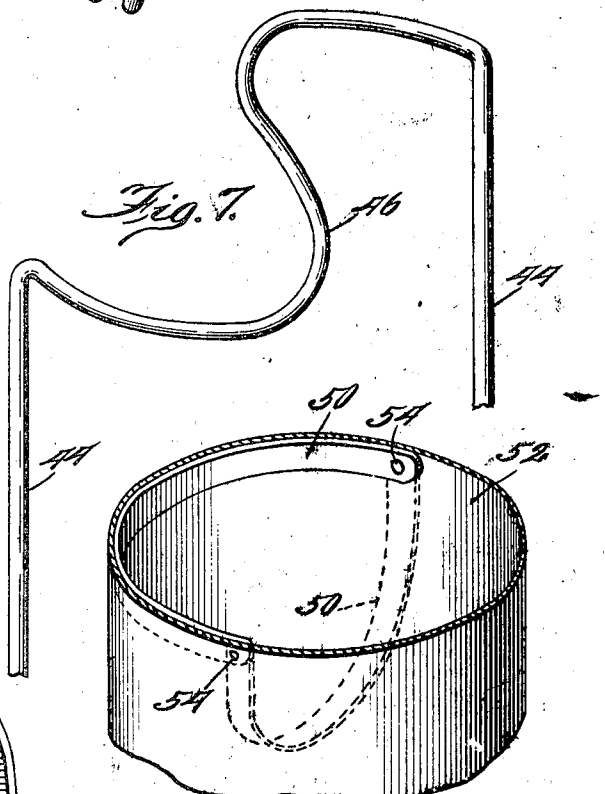



Fig. 8.

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Fig. 3.

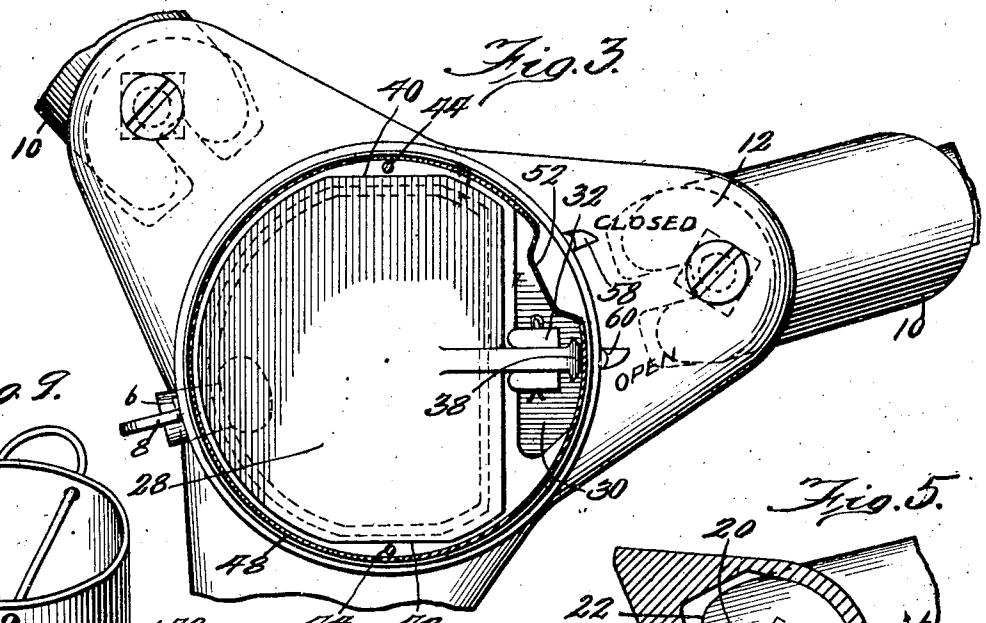



Fig. 5.

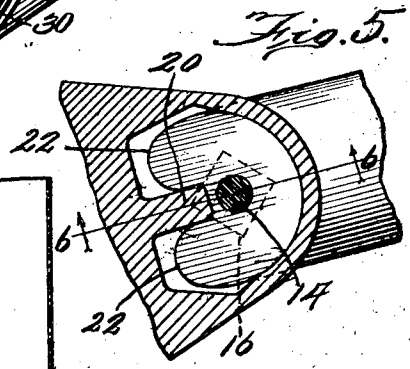



Fig. 7.

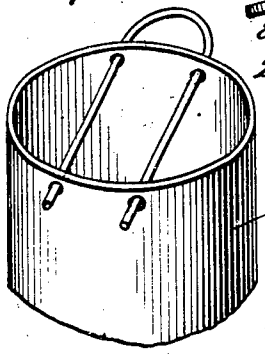



Fig. 4.

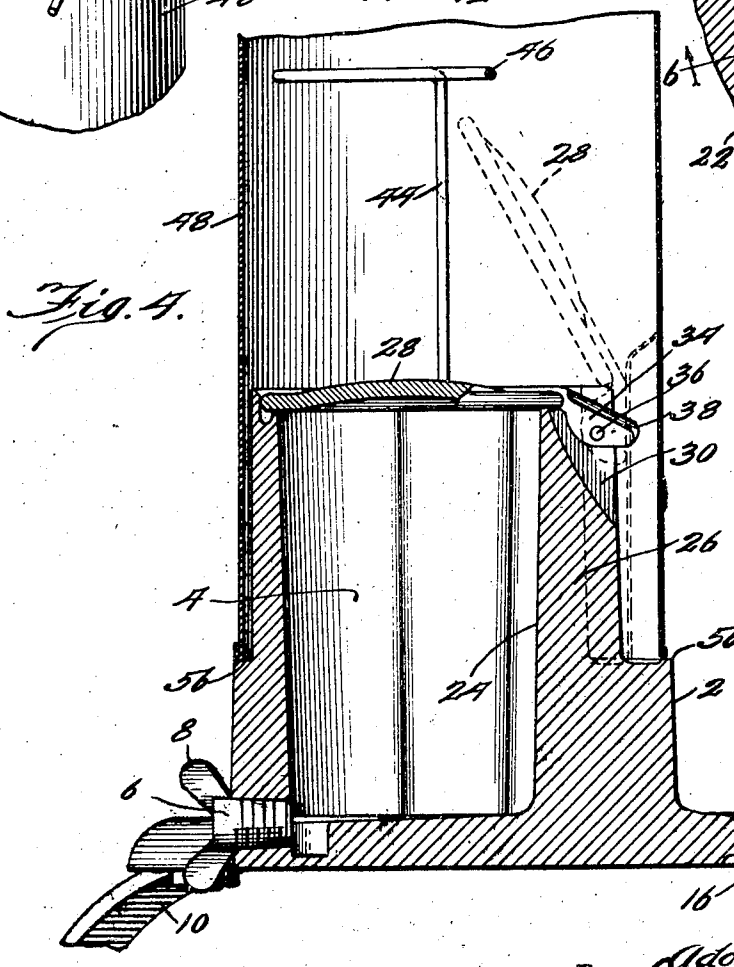
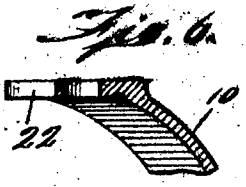



Fig. 6.




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Patented July 23, 1929. 1,722,100

# UNITED STATES PATENT OFFICE.

ADOLPH LANGSNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO EUGENE DIETZGEN COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE.

## DEVELOPING APPARATUS.

Application filed September 6, 1927. Serial No. 217,644.

This invention relates to developing apparatus for light sensitive paper and particularly to an apparatus for developing the paper by means of the fumes of a developing gas.

One of the objects of my invention is to provide a device adapted to contain a material, such as a liquid, and which device is arranged to wholly cut off the fumes of the gas arising from this material at the will of the operator, and particularly when the tube or other sensitive paper containing member is removed, as in positioning the paper or withdrawing it from the apparatus.

Still another object of my invention resides in providing a device of the above character wherein the gaseous fumes are automatically cut off by the act of positioning the paper containing tube or member or connecting it with the source of the gaseous fumes.

Still another object of my invention resides in providing a device of the above character wherein the paper to be developed is supported within the removable tube and in a manner such that the paper support is permanently mounted on the base and is not removable with the tube; and in a further manner so that the paper support will not interfere with the opening and closing of the cover for the well in which the liquid forming the gaseous fumes is contained.

Still another object of my invention resides in arranging the paper containing tube or tower on the base in such a manner that when in position thereon it will not interfere with the opening and closing of the cover for the liquid reservoir in the base.

A still further object of my invention resides in arranging the base, the paper containing tower or tube, and the closure for the base reservoir so that when the tube is inserted on the base the cover may be either automatically opened to permit gaseous fumes to arise in the tower or may be kept closed.

Still a further object of my invention resides in providing a convenient construction of base including a liquid reservoir, a detachable tube or tower therefor, together with means for supporting the base in elevated position from the ground or the support, wherein the legs of the base are spaced apart to permit the insertion of a drain cup beneath the legs and under a drain opening in the reservoir of the base; and the ancillary object of such latter construction is to provide a novel arrangement of interchangeable legs and means for connecting them to the base.

These and other objects of my invention will be apparent from a perusal of the following specification when taken in connection with the accompanying drawings wherein—

Figure 1 is a perspective view of my improved apparatus;

Fig. 2 is a plan view thereof;

Fig. 3 is a sectional through the tube or tower taken just above the cover when in closed position;

Fig. 4 is a sectional side view of the lower portion of the tube and upper portion of the base;

Fig. 5 is a sectional view of the junction between the base and the leg;

Fig. 6 is a sectional view of one of the detached legs;

Fig. 7 is a perspective view of one form of my wire or support for holding the paper within the tube;

Fig. 8 is a modified form of the paper support; and

Fig. 9 is a further modification of this tube support.

Referring now to the drawings in detail, my invention comprises a suitable base having a well or liquid reservoir to receive the usual developing liquid such as ammonia. This base is provided with a cover for the well which is adapted to raise and lower so as to permit the gaseous fumes to rise or, alternately, to wholly enclose the gaseous fumes so they cannot escape. In addition the base is adapted to receive a relatively long tube or tower in which the sensitive paper to be developed is supported, preferably as in a roll, and in a manner so that the gaseous fumes arising from the well will pass upwardly into the end of the tube, the top of which is closed, so that the light sensitive paper therein will be developed.

In my present invention this tube and the cover for the reservoir in the base are arranged so that in the act of positioning the tube on the base the cover for the reservoir may be automatically opened or closed, or may be retained in closed position without opening so that the possibility of fumes escaping from the reservoir when the tube or tower is removed with the paper therein is eliminated.

In carrying out my invention I have formed a base 2 preferably of a casting and

have provided it with an upstanding well 4 for receiving the liquid developing material. One side of the bottom of this well 4 is provided with a drain opening 6 controlled by a screw plug having a thumb nut turning member 8. In addition the base is provided with a plurality of lugs 10 so arranged and spaced apart in relation thereto. In the present instance three of these legs are shown equally spaced about the periphery of the base. As shown in Figs. 5 and 6 these legs are detachable from the base, being preferably bifurcated at their upper ends and formed with central slots slideable to engage an undercut formed on the flanges 12 of the base so that bolts 14 passing through said slots and through the flanges 12 of the base will hold these lugs in assembled relation. In addition the nuts 16 are arranged to co-operate with angular faces 18 on flanges of the base to prevent rotation of these nuts 16. In addition the upper supports of each flange 12 is provided with a tongue 20 which engages within a corresponding recess of the slot 22 formed in the upper portion of the leg to assist in primarily holding these lugs assembled to the base flanges 12.

It will be noted that by reason of the location of the drain 6 at a point between two adjacent lugs, a cup or other container may be positioned beneath the drain opening to receive the liquid.

By reference to Figs. 3 and 4 of the drawings it will be observed that the well does not form a true cylinder but is flat at the side 24 thereof caused by the thickness of the wall 26. This construction is utilized so that the cover 28 for the wall may be hinged to the upper portion of the base in a manner to permit the cover to open substantially completely, or in other words so that the cover may open to an almost vertical position. This is accomplished by slotting the upper portion of the wall 26 as at 30, and by providing upstanding ears 32 thereon between which the extension 34 of the cover is pivoted as at 36. This extension 34 is downwardly inclined and is formed with a rounded cam-shaped nose 38 which overlies the slot 30. The cover is circular except at that part which overlies the thickened wall 26 and except at two diametrally opposed parts of 40 and 42. These parts are flattened at the periphery thereof so as to permit the vertical legs 44 of the wire or support for the paper 46 to arise vertically or straddle the cover 28. In this manner the cover may freely open and close without interfering with the legs 44. These legs of the wire or support arise above the extreme opened position of the cover 28 and are integrally united by a horizontal portion 46 of the wire, which portion is bent in any preferable design so as to form a support or ledge for the lower end for a roll of paper 46. In this manner the paper is supported within the cover by the wire or bracket 46 and in a manner so that the cover 28 may freely open and close, and so that the tube or tower 48 (preferably made of glass) may be removed from the base 2. Particular attention is directed to the fact that the wire 46 or paper support is permanently mounted on the base and that it is not removed with the tube, but when the tube with the paper therein is inserted on the base the wire serves to support this paper above the liquid-contained reservoir.

In Fig. 8 of the drawing I have shown a modified form of this paper support which comprises a sheet metal bail 50 permanently and pivotally mounted to the inner walls of the tube 52 as by means of the pivots 54. This bail is arranged so that when horizontally positioned it resiliently grips the inner wall surfaces of the tube 52 and may be swung either downwardly or upwardly or vertically as shown in the dotted lines of the figure to engage and support the paper in the tube.

In Fig. 9 of the drawing I have shown still another modification wherein the wire support for the paper has its ends formed with slight hook-like portions adapted to space through spaced perforations in the tube whereby the wire is shiftably mounted with respect to the tube, and when in inward position supports the paper as shown in the drawing.

One of the advantageous features of my present invention resides in forming the tube so that by its movement or by its insertion into place on the base it may automatically control the opening and/or closing of the cover 28 for the reservoir. One manner in which to accomplish this is shown in the present drawings wherein the tube is formed with an inwardly bent or crimped portion 52 so that when this portion lies directly over the nose 38 of the extension 34 of the cover and when the tube is moved downwardly in the act of positioning it on the shoulder 56 of the base, this crimped portion 52 will contact the nose 38 and will lift the cover into vertical position and will hold it there until either the tube is withdrawn or until the tube is rotated so that the crimped portion 52 will light to one side of the nose 38.

It will also be appreciated that this opening and closing of the cover 28 may be controlled by angularly shifting the tube 48 on the base 2 rotatably so as to bring the crimped portion 52 into or out of contact with the nose 38, and this crimped portion 52 is formed with this operation in mind, being provided with gradually inclined surfaces which accomplishes an automatic raising and lowering of the cover 28 by contact with the nose 38 when the tube is moved angularly about a vertical axis.

In order to provide an indication so that the operator will know when the cover 28

is open or closed, as, for instance, when a transparent glass tube is not used, I have provided one of the flanges 12 of the base with indicating marks 58 and 60 which are designated closed and open respectively. These marks 58 and 60 are so located that when the crimped portion 52 is shifted opposite them it will correspond to a position wherein this crimped portion is either out of contact with or in contact with the nose 38 of the extension 36 on the cover, and hence will indicate whether or not the cover has been opened or closed.

From the foregoing it will be appreciated that I have provided a very ingenious and advantageous construction for the development of sensitive paper by means of gaseous fumes; this structure, by reason of its compactness and particularly by reason of the automatic means for closing the well, eliminates the objectionable feature of existing devices, that is the escape of the obnoxious fumes into the atmosphere when the tube is inserted and removed.

It will also be appreciated that by reason of the novel construction of the paper support or bracket I am enabled to permanently mount this bracket on the base so that it does not constitute a part which may be lost during the operation of my device, and further that by reason of the novel construction of this paper bracket I am enabled not only to have it project well up into the tower or tube where it may support the paper in the gaseous zone in the tube, bearing in mind that this gas arises to the upper end of the closed tube, but I am also able to support the paper in a manner such that the support does not interfere with the opening and closing of the reservoir. The construction of the cover 28 and the manner of pivotally mounting it upon the walls forming the well is also a most advantageous construction, since this cover is thus arranged to open substantially to full position and thereby permit the quick escape of the gaseous fumes from the well; in addition this construction provides an effective seal for the top of the well when the cover is closed, yet at the same time permits the positioning of the vertical legs 44 of the wire bracket on the walls of the well.

It will also be appreciated that by reason of the construction of the detachable tube or tower and the hinged portion of the cover, I am able to provide in a simple construction the automatic control of the cover from the exterior of the tube either by the act of positioning the tube or the base by the act of shifting the tube on the base when once it is in position thereon; and finally it will be appreciated that by the arrangement of the indicating means on the base of the flange I am able to instantly advise the operator as to whether or not the cover is closed; and further by use of the novel positioning of the drain I am able to easily remove the spent developing liquid from the reservoir.

It will be understood that in my present invention the developing liquid is inserted into the well from the top and that when once in the well the well is kept closed and practically sealed by means of the cover 28.

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

1. In a device of the class described, the combination of a base provided with a reservoir for containing developing liquid, a detachable tower for holding light-sensitive paper and adapted to be manually positioned on said base over the reservoir so as to permit the fumes of the reservoir to rise through the paper in the tower and means associated with said tower and base for automatically closing the reservoir when the tower is withdrawn from the base.

2. In a device of the class described, the combination of a base provided with a reservoir for containing developing liquid, a tower for holding light-sensitive paper and adapted to be shifted relative to said base and adapted to enclose the reservoir so as to permit the fumes of the reservoir to rise through the paper in the tower and means associated with the tower and base for automatically closing the reservoir when the tower is shifted relatively to the base.

3. In a device of the class described, the combination of a base provided with a reservoir for containing developing liquid, a tower bodily removable from the base and adapted to hold light-sensitive paper and adapted to be positioned on said base over the reservoir so as to permit the fumes of the reservoir to rise through the paper in the tower and means associated with the tower and base for closing the reservoir on removal of the tower.

4. In a device of the class described, the combination of a base provided with a reservoir adapted to contain developing liquid for creating gaseous fumes, a cover for said reservoir, a tower movably mounted with respect to the base and adapted to contain light-sensitive paper to be positioned over said reservoir, and means carried by the tower for causing the automatic operation of the cover whereby the opening and closing of the cover may be controlled by the movement of said tower.

5. In a device of the class described, the combination of a base forming a reservoir adapted to contain a quantity of developing liquid adapted to create fumes, a closure for said reservoir, a tube adapted to be mounted on said base and to enclose the mouth of said reservoir and means carried on the inner wall of said tube for causing the opening of said closure when the tube is inserted on the base.

6. In a device of the class described, the

combination of a base having upstanding walls forming a reservoir for developing liquid, the outer faces of said wall being cut away to form a shoulder, a substantially elongated tube adapted to have its lower end rest on said shoulder and to enclose said reservoir, a portion of the upper walls forming said reservoir being slotted, a cover for said reservoir having an extension pivotally mounted in the slotted portions and said tube having an inwardly extending cam shaped portion adapted to cooperate with the cover extension for controlling the opening and closing of the latter.

7. In a device of the class described, the combination of a base having upstanding walls forming a reservoir for containing developing liquid, a cover pivotally mounted on the upper portions of said wall and adapted to wholly close the mouth of said reservoir, a bracket upstanding from the upper walls of said reservoir on either side of the closure whereby to permit the free opening and closing of the closure, said bracket having a horizontally extending portion overlying the closure and spaced from its maximum open position and a tube having its lower end mounted on said base and enclosing the bracket and the upper walls of the reservoir.

8. In a device of the class described, the combination of a base forming a reservoir to receive developing liquid, said base having a paper holding bracket mounted thereon and extending upwardly, a cover pivotally mounted on said base to close the mouth of the reservoir, said cover being arranged to clear said bracket in its open position, a tube resting on said base and enclosing a portion of the reservoir and said bracket, said tube having an inwardly extending portion for cooperating with the pivotally mounted cover to automatically shift the cover when the tube is inserted on the base.

9. In a device of the class described, the combination of a stationary base having upstanding walls of substantially circular cross section, a substantially arcuate portion of the periphery being thickened and slotted, a cover adapted to seal said opening and pivotally mounted in said slotted portion to permit the cover to open to full extent and be within the circumferential walls of the base, a shiftable tube mounted on said base and enclosing the reservoir and means for supporting a paper roll within the tube above the reservoir.

10. In a device of the class described, the combination of a base having upstanding walls forming a reservoir for containing developing liquid, said upstanding walls being substantially circular in cross section, a cover pivotally mounted on said upstanding walls and adapted to close the mouth of the reservoir, said cover having spaced apart cut away portions at its periphery, upstanding bracket legs mounted on the upper edge of the wall at the cut away portions of the cover, said bracket legs rising above the open position of the cover and a tube mounted on said base adapted to enclose the bracket and the upper portion of the reservoir.

11. In a device of the class described, the combination of a base forming a reservoir for developing liquid and a wire having vertical legs permanently attached to the upper mouthal portions of the reservoir, said wire having an integral horizontally disposed intermediate portion for supporting a roll of paper and a tube adapted to enclose the reservoir in the base and the bracket.

12. In a device of the class described, the combination of a base having upstanding walls, an arcuate portion of said upstanding walls being of thicker dimension than the remaining portion, the upper portion of said thicker section being cut away, and a cover adapted to close the mouth of said reservoir, said cover having an extension pivotally mounted on said cut away portion, said extension projecting beyond the marginal walls of the cut away portion and a tube enclosing the upper portion of said reservoir and resting on the base, said tube having an inwardly extending peripheral portion adapted to cooperate with the cover extension to control the opening and closing of said cover extension.

13. In a device of the class described, the combination of a base having upstanding walls forming a reservoir for a developing medium, a tube for containing light sensitive material to be developed and adapted for insertion on said base to enclose the mouth of the reservoir, said base having flanges radiating from said upstanding walls and spaced apart, the bottom portion of said reservoir having a drain opening extending between a junction of two of said flanges and leg members mounted on said flanges, said leg members depending whereby to permit the positioning of a container beneath the drain opening and between adjacent legs.

14. In a device of the class described, the combination of a base having upstanding walls forming a reservoir, a tube mounted on said base and enclosing said reservoir, said base having radially extending flanges provided with cut outs on their under surfaces, the inner walls of said cut outs including an arcuately extending lug, a plurality of detachable legs, each leg being bifurcated on its upper end whereby said furcations may be inserted in the cut outs of the flanges with the lug of the flange extending in a space between the furcations, said flanges and legs being apertured to receive bolts passing therethrough and nuts on said bolts for holding said legs and flanges in assembled relation.

15. A developing device for light sensitive material comprising associated members

which are relatively movable and which are constructed and arranged to form a developing chamber for enclosing light sensitive material therein to be developed, one of said members having means forming a container for a source of developing medium adapted to give off developing gas, closing means for controlling communication of said gas to and from that portion of the chamber containing the light sensitive material to be developed, and means operated by the relative movement of said members for actuating said closing means.

16. In a developing apparatus, the combination of relatively movable members forming a developing chamber, one of said members adapted to hold a quantity of liquid for giving off developing gas, means for supporting light sensitive material in said chamber in position to be acted upon by said gas, and means actuated by the relative movement of said relatively movable means for cutting off the gas from said chamber.

17. A developing device for light sensitive material comprising means forming a container for liquid ammonia, an independent tube adapted to be placed on said container to enclose the gas evolved from said ammonia, a cover for said container, and means operated by the attachment or detachment of said tube to and from the container for automatically operating the cover to control the admission of gas to said tube.

18. In a device of the class described, the combination of a container, a tube seated in upstanding means on said container and adapted to hold light sensitive material to be developed, said tube being rotatable on said container in a vertical axis, a cover for said container, and means operated by the rotatable movement of said tube for operating said cover.

19. In a device of the class described, the combination of a base having means adapted to evolve developing gas, a closure for said holding means, a closure operating member and a tube adapted to be associated with said base to form said holding means, an enclosing developing chamber for light sensitive material to be acted upon by said gas, and means on said tube for operating said closure operating means.

20. In a device of the class described, the combination of a base having means adapted to evolve developing gas, a closure for said holding means, a closure operating member and a tube adapted to be associated with said base to form said holding means, an enclosing developing chamber for light sensitive material to be acted upon by said gas, and means on said tube for operating said closure operating means, said means on the tube being constructed and arranged to actuate said closure by the bodily movement of the tube relative to the base.

In witness whereof, I have hereunto subscribed my name.

ADOLPH LANGSNER.