

M. H. STOCKWELL.
PHOTOGRAPHIC PLATE DEVELOPING APPARATUS.

APPLICATION FILED DEC. 20, 1904

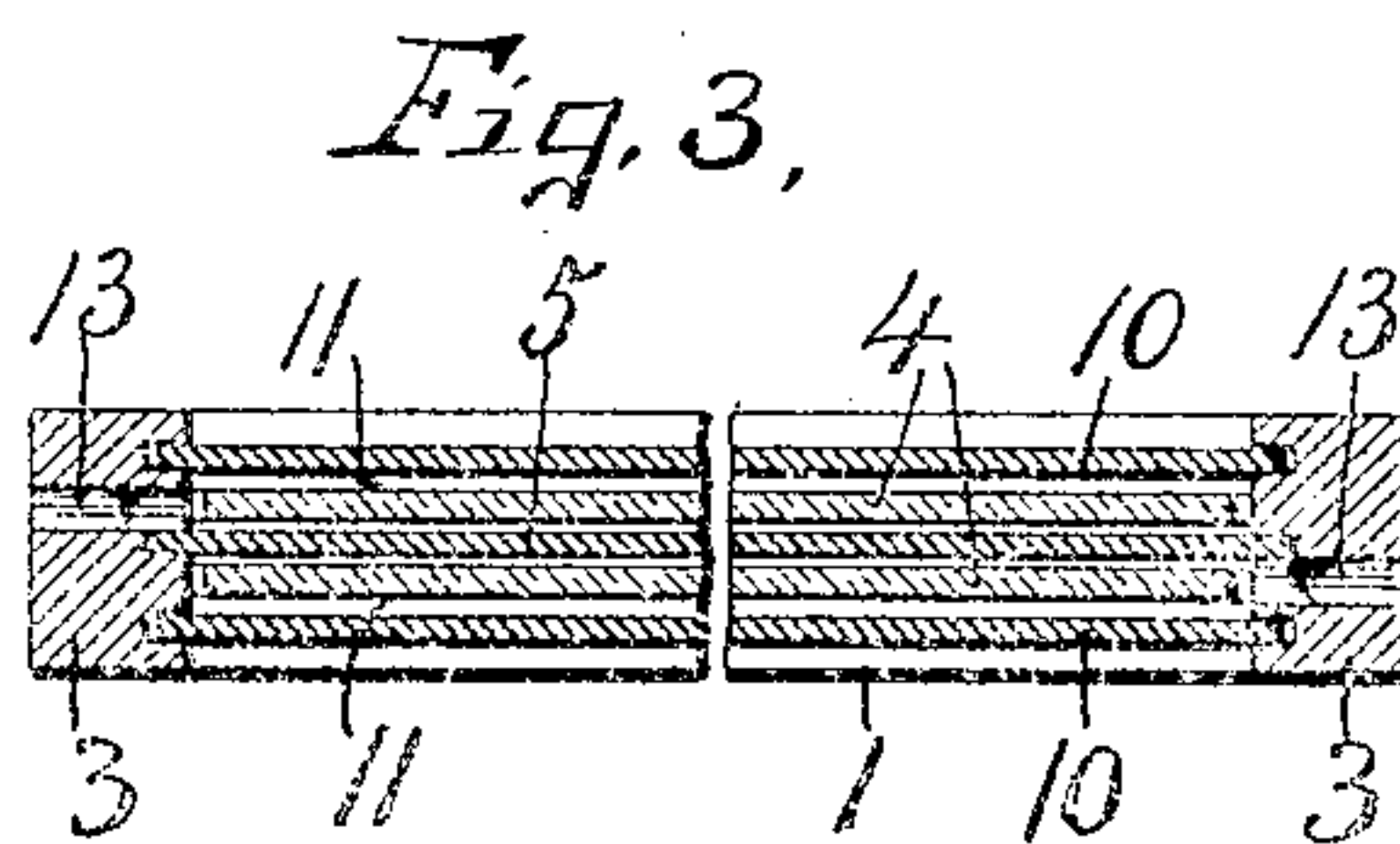
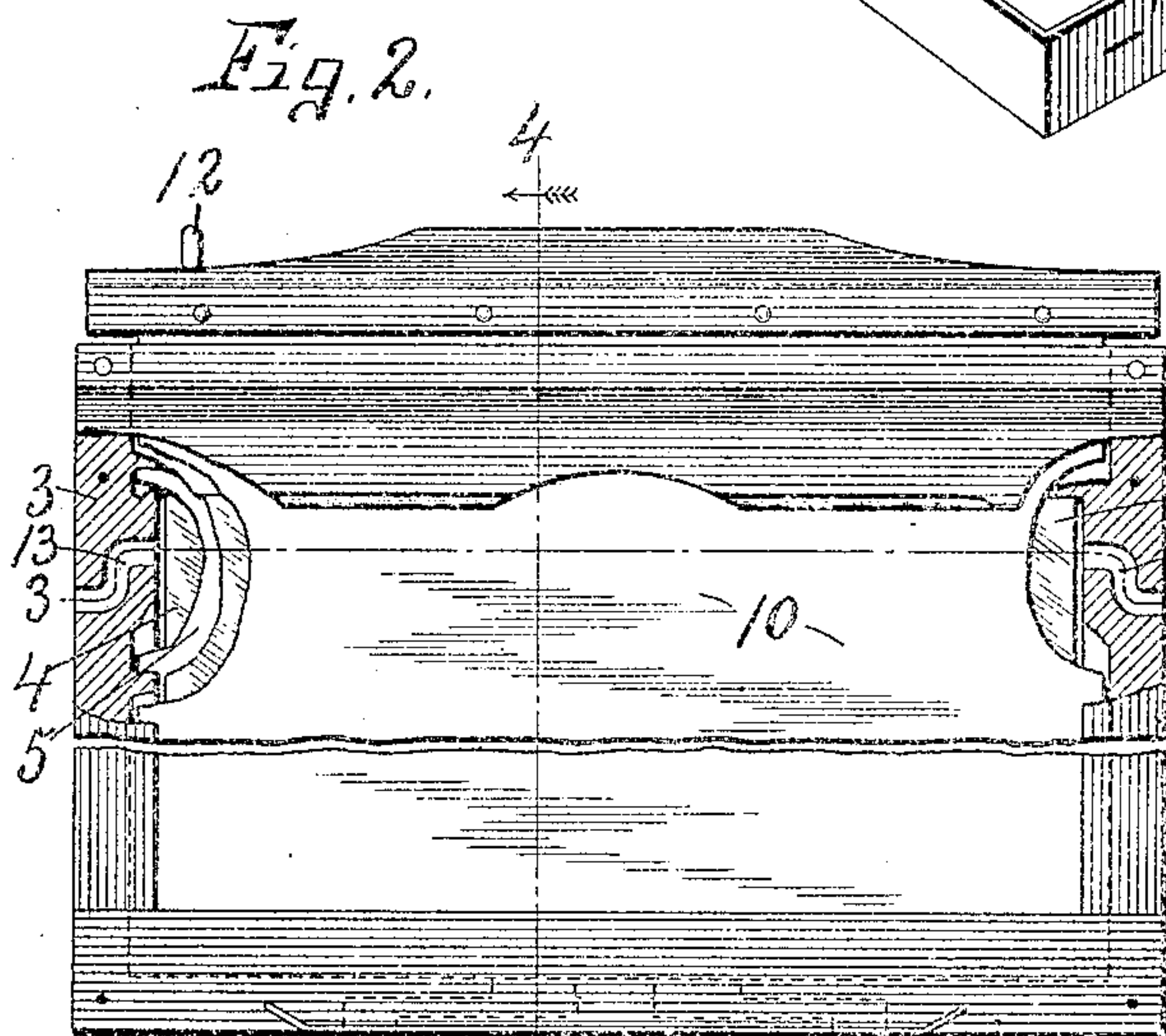
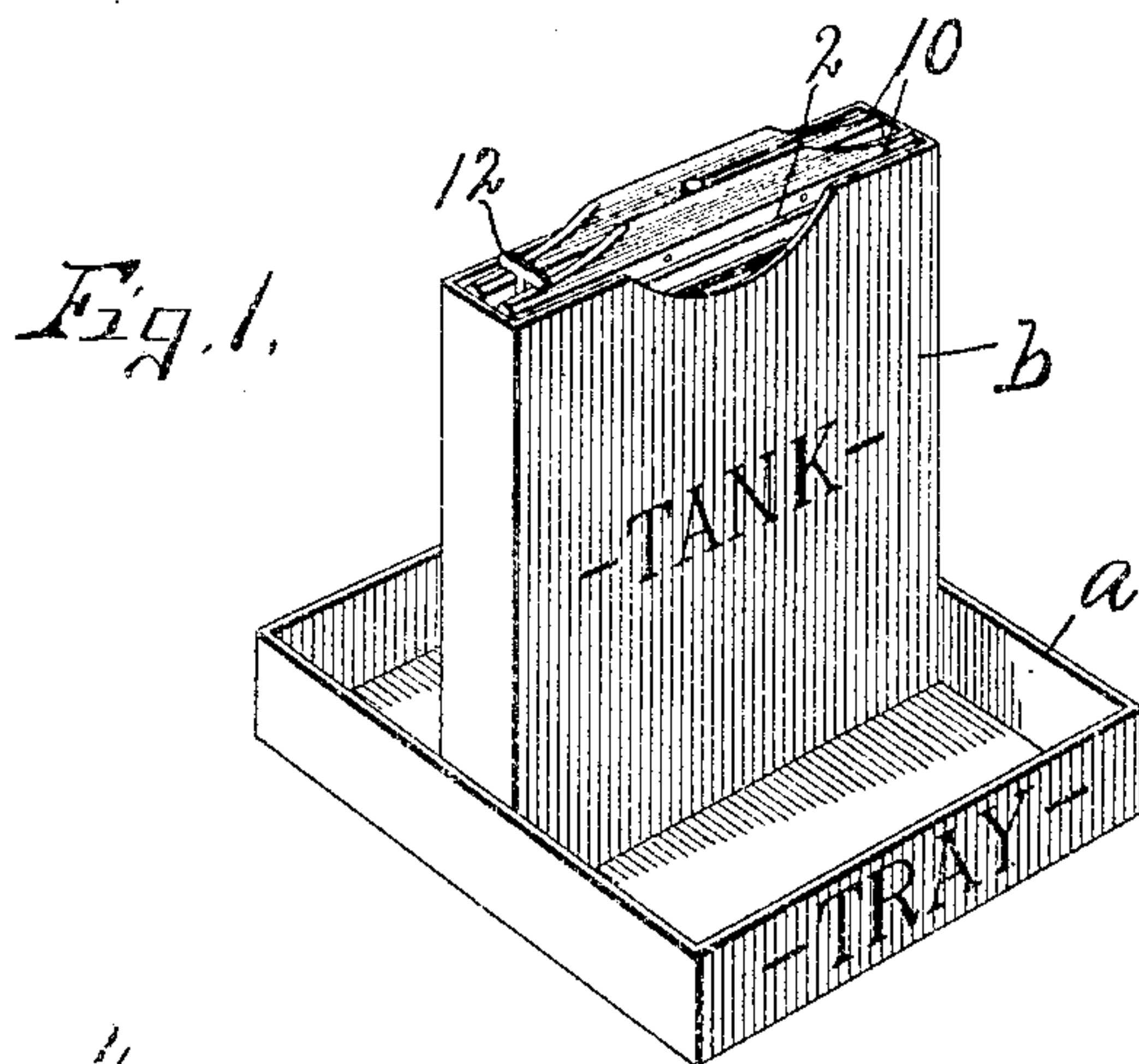
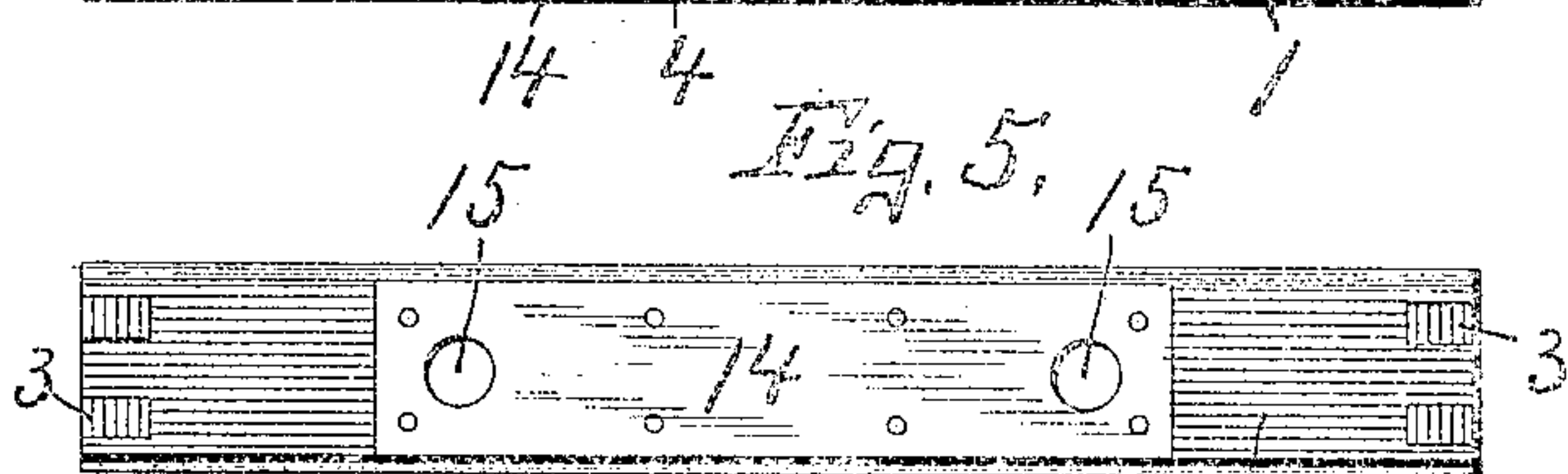
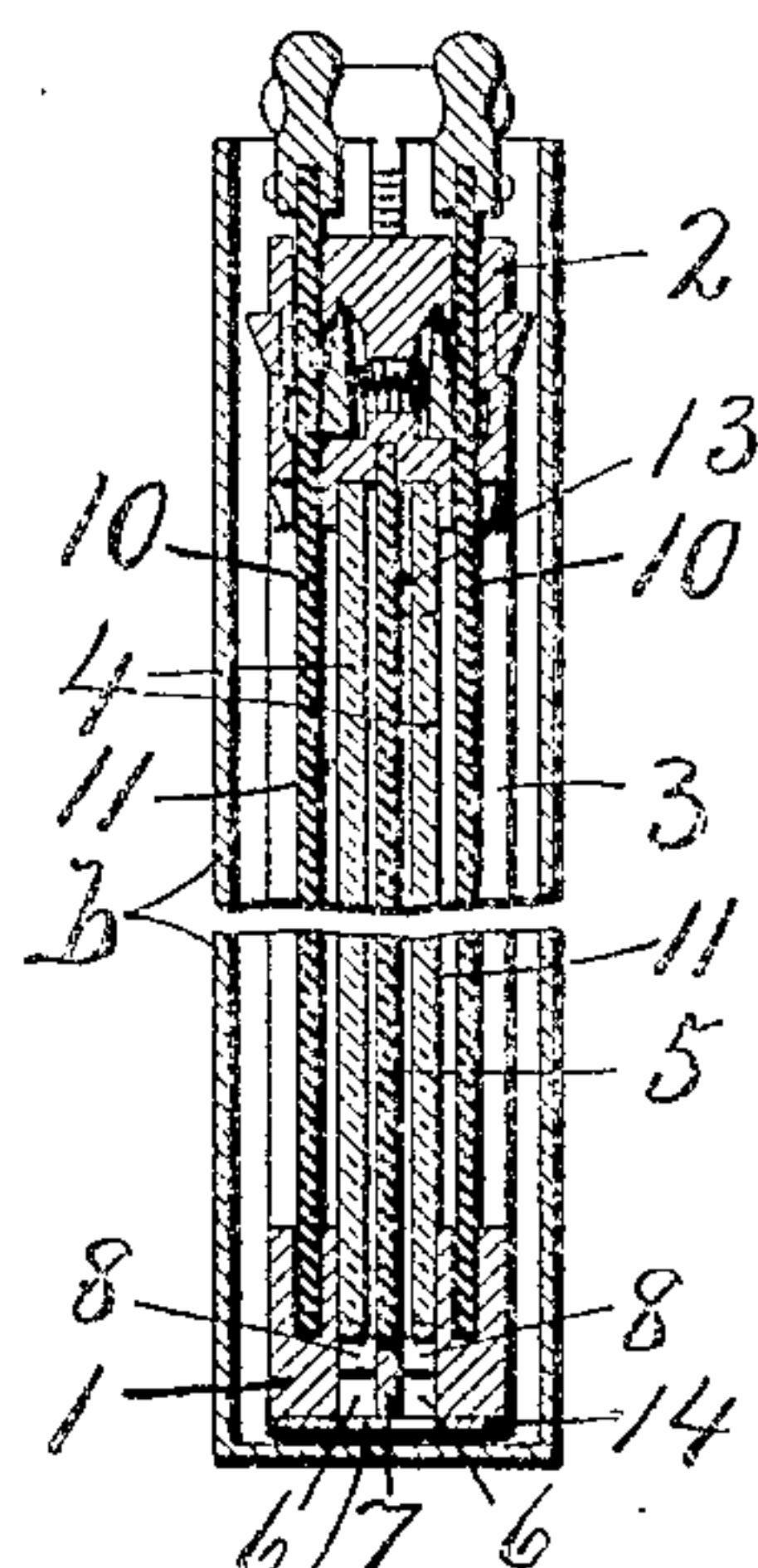


Fig. 4.



WITNESSES:

B. C. Robinson.
H. E. Chase

INVENTOR:
Myron H. Stockwell

BY:

Howard P. Dinkens
ATTORNEY.

UNITED STATES PATENT OFFICE.

MYRON H. STOCKWELL, OF GENEVA, NEW YORK.

PHOTOGRAPHIC-PLATE-DEVELOPING APPARATUS.

No. 804,442.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed December 20, 1904. Serial No. 237,682.

To all whom it may concern:

Be it known that I, MYRON H. STOCKWELL, of Geneva, in the county of Ontario, in the State of New York, have invented new and useful Improvements in Photographic-Plate-Developing Apparatus, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to an improved photographic-plate-developing apparatus, including the plate-holder, in which the negatives may be "developed" and "fixed" on the premises without removal. The usual practice is to remove the plates from the holder and afterward "develop" and "fix" them one by one in a suitable "dark room" or laboratory; but in many instances the views are taken at places remote from any laboratory or dark room or other accessories for "developing" and "fixing," and it is therefore necessary to carry the exposed plates a considerable time and distance before they can be developed and fixed and their clearness determined. Furthermore, the clearness of the negative before development is always more or less uncertain, and it frequently happens that after considerable labor and expense to procure a photograph of a particular scene or object which cannot be taken again after leaving the premises the negative proves to be either a blank or too indistinct to be of any value, and the view and opportunity for reproduction is therefore lost.

The object of my invention is to enable the operator to develop and fix the negative-plates on the premises in daylight or at any time without removing the plates or "slides" from the holder and to thereby avoid the expense of dark rooms or laboratories and enable the operator to obtain with certainty at least one perfectly developed and fixed negative before disturbing the camera or leaving the scene. This I accomplish by providing the bottom and one or both of the upright sides of each plate-chamber with one or more comparatively small apertures which are designed to exclude the light and at the same time allow the developing and fixing liquids to enter the chambers and gradually ebb and flow across the sensitized plates as the holder is gently raised and lowered in a suitable dipping-tank

containing the desired developing or fixing liquid, all as hereinafter more fully described.

In the drawings, Figure 1 is a perspective view of an overflow-tray and liquid-containing tank in which is inserted my improved plate-holder. Fig. 2 is a face view of the plate-holder, partly broken away and partly in section to show the liquid-passages. Figs. 3 and 4 are sectional views taken, respectively, on lines 3 3 and 4 4, Fig. 2, the central portions being broken away. Figs. 5 and 6 are inverted edge views of the plate-holder seen in Fig. 2, a part of the bottom plate being broken away in Fig. 6 to show the adjacent liquid-passages. Fig. 7 is an edge view of a modified form of tank, the tank shown in this figure being flexible and shown in its collapsed condition.

In carrying out the objects stated I may provide an overflow-tray *a* for receiving a flexible or rigid bag or tank *b*, which is open at the top and is adapted to contain a developer and fixing liquid and into which the plate-holder is inserted and moved vertically in the act of developing and fixing the negative-plates.

The plate-holder may be of any size or material—such as vulcanized rubber, wood, or other substance adapted to resist deterioration by the developer or fixing liquids—and preferably consists of a rectangular form composed of bottom, top, and side pieces 1, 2, and 3, which are rigidly inserted at their meeting ends to form an intervening open space in each of its opposite faces to permit the insertion and removal of the sensitized plates. This plate-holder is adapted to receive and hold two sensitized plates 4 4, and is therefore provided with a central transverse vertical partition 5, of rubber or other suitable material, which is located midway between the opposite faces of the frame and is suitably joined at its edges to the inner edges of the bottom, top, and side pieces 1, 2, and 3 to prevent the passage of light or liquid through the opening in the frame from side to side and also to separate the sensitized plates one from the other.

The bottom 1 of the frame has in its lower face elongated channels 6, which are united at the ends, but are separated through the greater part of their lengths by a central lengthwise rib 7, and extending upwardly from

each channel 6, through the upper face of the bottom 1, is one or more (in this instance two) comparatively small apertures 8 to permit the influx and exit of the liquid to the plates as the holder is raised and lowered in the tank.

The rib 7 is in vertical alinement with and forms a continuation of the partition 5, and therefore the apertures 8 at either side of the rib 7 communicate with the interior of the plate-holder or corresponding sides of the partition 5 to permit the inflow of the liquid to each plate-chamber when the holder is immersed in the liquid in the tank *b*.

The inner edges of the bottom 1 and sides 3 are grooved to receive the bottom and side edges of opposite slides or shutters 10, which are spaced equidistant apart from the center partition 5 to form opposite compartments 11 for receiving the plates 4. These slides or shutters 10 extend upwardly through slots in the top 2 and are formed with suitable hand-pieces by which they are inserted into and removed from the frame, but are locked in operative position by a movable catch 12.

The plates 4 and shutters 10 are inserted and removed in the usual manner for double plate-holders, the shutting serving the purpose of excluding the light from the plates and also to facilitate the capillary action of the developer or fixing liquid over the surfaces of the plates.

The thickness of the plates 4 is slightly less than the distance between the partition 5 and shutter-slides, so as to leave sufficient space between the sensitized surfaces and shutters to allow the free flow and ebb of the liquid across said surfaces as the holder is raised and lowered by hand in the tank *b*.

A tortuous light-excluding passage 13 is formed in each of the side pieces 3, near but just below the top 2, one of the passages leading from one of the plate-compartments through one side 3, and the other passage leads from the other compartment through the opposite side 3 to allow the escape of air and also to permit the inlet of the liquid as the plate-holder is immersed therein.

The inner end of each passage 13 is offset out of alinement with the outer end, thus forming an angular passage to prevent the entrance of light to the plate-compartments 11.

The bottoms of the channels 6 are covered by a plate 14, having apertures 15, each communicating with one end of both channels, but out of vertical alinement with the apertures 8, so as to form tortuous passages to prevent the entrance of light to the plates when the holder is exposed or withdrawn from the tank *b* and at the same time allow the free influx and exit of the liquid as the holder is lowered and raised in the tank.

Although I have shown a double plate-holder, it is evident that the principle of my invention may be carried out with any ordi-

nary holder for one or more plates by simply providing one or more of the inclosing walls of each plate-compartment with one or more passages to permit the inflow and exit of the liquid and air and dipping such holder into a bag or tank containing the developer or fixer liquid, as required. The interior dimensions of the tank *b* being substantially the same as the dimensions of the plate-holder, it is apparent that only a small quantity of the liquid is required in the tank to completely envelop the plates when the holder is immersed.

In operating my invention a suitable quantity of developer liquid is first placed in the tank *b*, and the plate-holder containing the negative plate or plates and shutter-slides is then gently inserted into the tank, whereupon the developer liquid passes through the openings 15 and 8 into the plate-compartments, while the air is free to escape from such compartments through the passages 13. The holder is gradually raised and lowered in the liquid until the negatives are clearly brought out, after which the developer is emptied from the tank and replaced with water and the operation repeated to wash the developer from the plates. The degree to which the negative is developed can be determined by an experienced photographer by subjecting the negative for a predetermined length of time to the action of a developer of known strength. When this operation is completed, the liquid is again removed from the tank *b* and replaced with the fixing liquid, and the operation of immersing the plate-holder is again repeated until the negative is properly fixed. The negatives are now fixed and may safely be exposed to the light, so that the final washing of the plates with water may be done by a repetition of the operation above described, or the shutters may be removed and the plates washed either in the holder or after removing them, after which the plates are allowed to dry or may be taken from the premises while wet, if necessary, in their respective plate-holders.

In Fig. 7 of the drawings I have shown a tank *b* as being composed of flexible material, such as india-rubber cloth, and in this figure it is shown in a collapsed condition. This form of tank is very convenient, as it may be carried in the pocket.

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

1. In an apparatus for developing and fixing photographic negatives, a photographic-plate holder having a bottom and side walls and shutters, said plate-holder being adapted to be immersed in developing and fixing liquids and being provided with tortuous liquid-passages in its bottom and tortuous air-passages in its sides, said liquid and air passages being disposed wholly between the in-

ner and outer surfaces of the bottom and side walls, respectively.

5 2. A photographic-plate holder adapted to be immersed in a developing liquid, having a partition dividing it into opposite plate-compartments and having movable shutters, the bottom and one side of each compartment each having a tortuous light-excluding passage

formed between the inner and outer walls of said bottom and side, respectively.

In witness whereof I have hereunto set my hand this 3d day of December, 1904.

MYRON H. STOCKWELL.

Witnesses:

E. H. NERLICK,

FRANK L. BEDELL.