

No. 799,571.

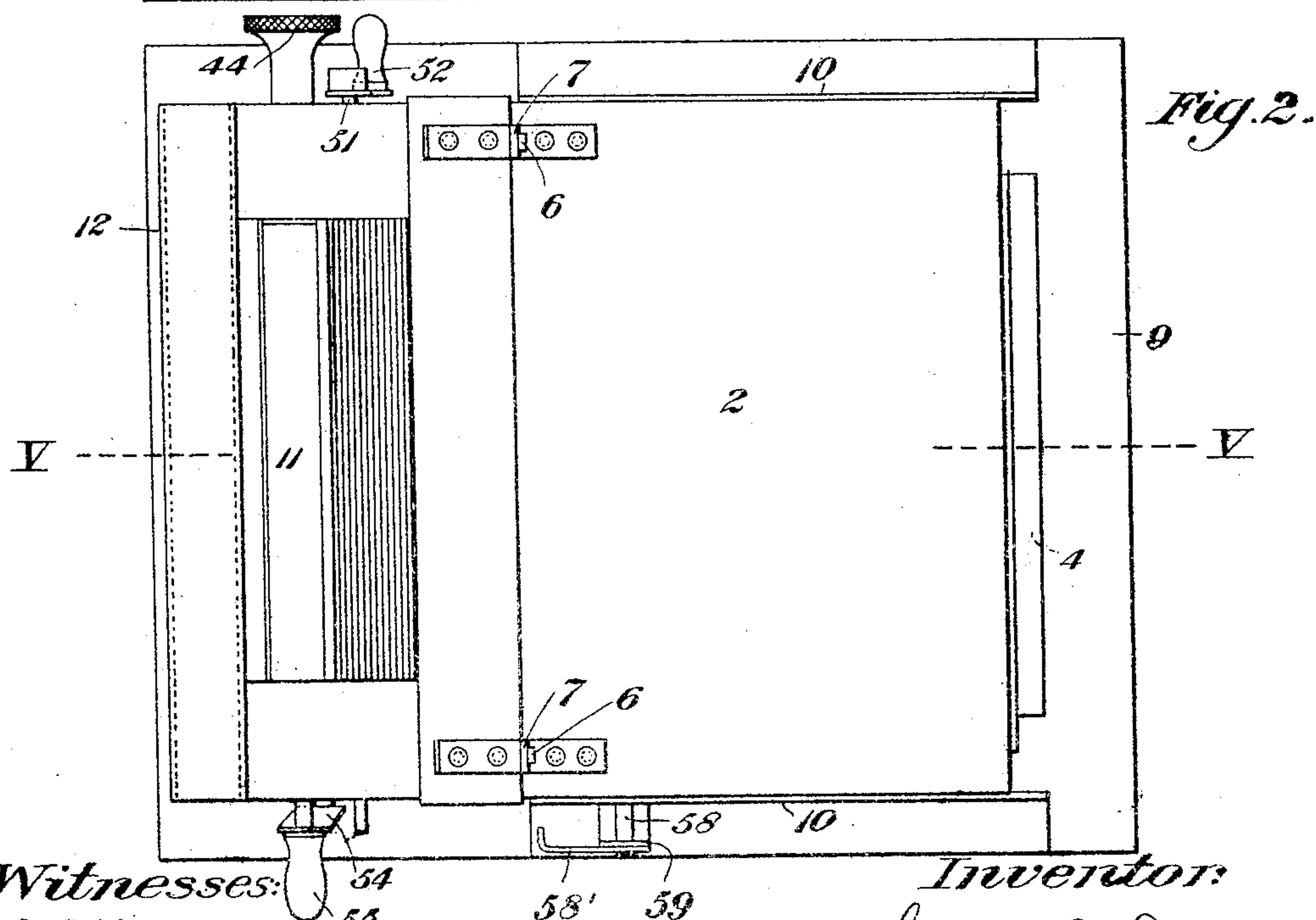
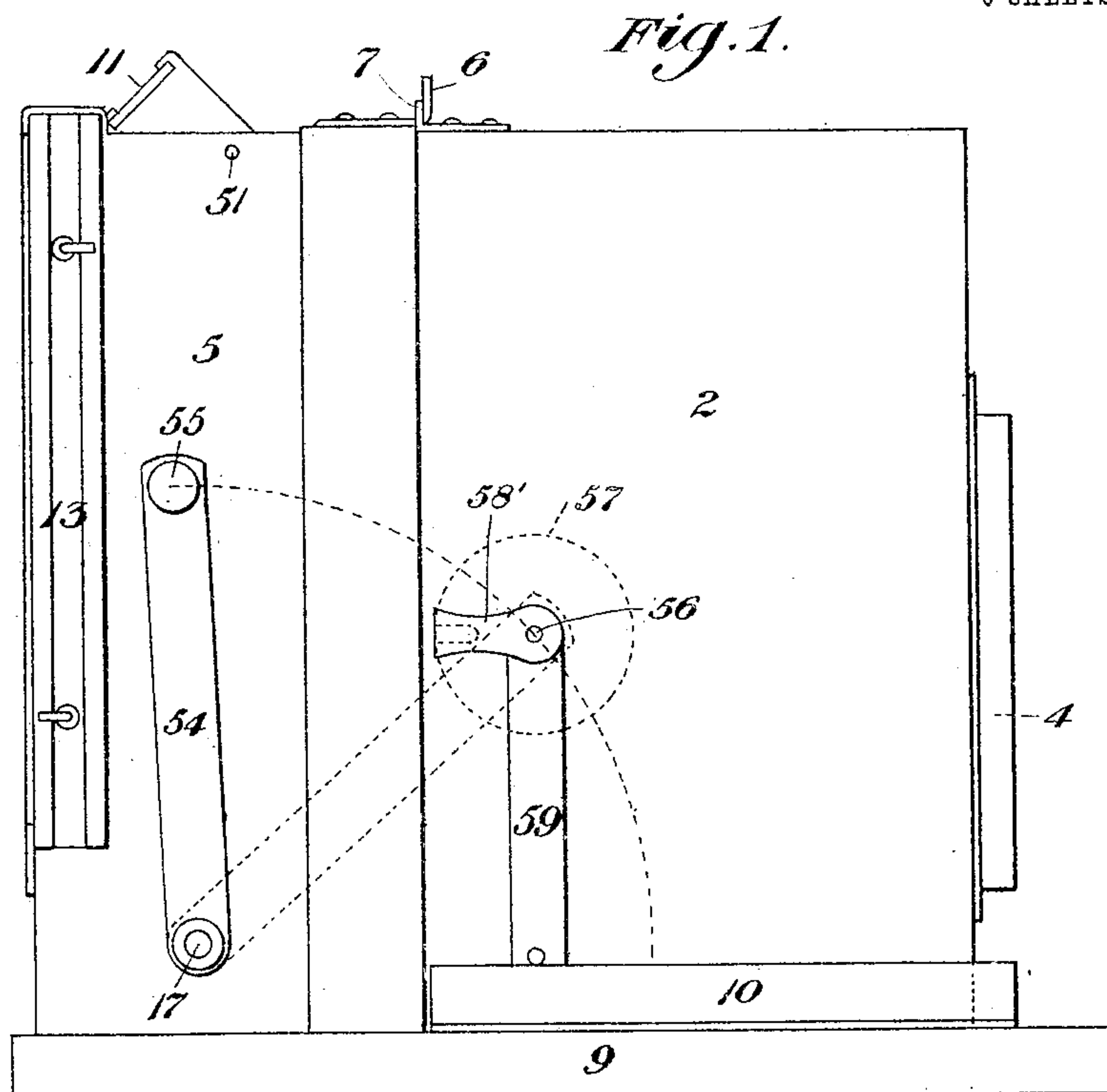
PATENTED SEPT. 12, 1905.

J. D. LYON.

## DEVELOPING APPARATUS FOR PHOTOGRAPHIC PLATES.

APPLICATION FILED JUNE 30, 1903.

6 SHEETS—SHEET 1.



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55  
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Jesse D. Lyon  
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6 SHEETS—SHEET 2.

Fig. 3.

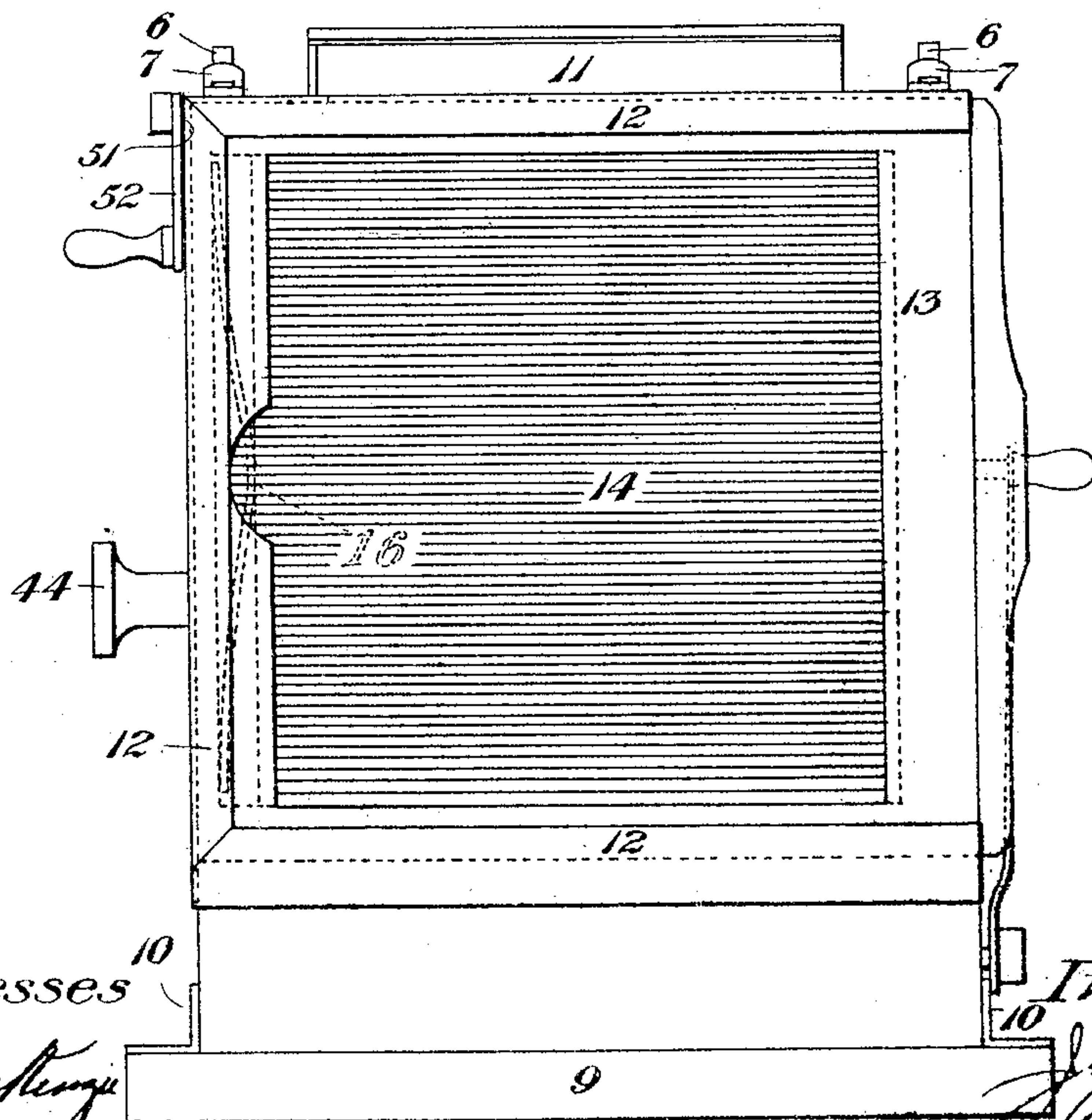
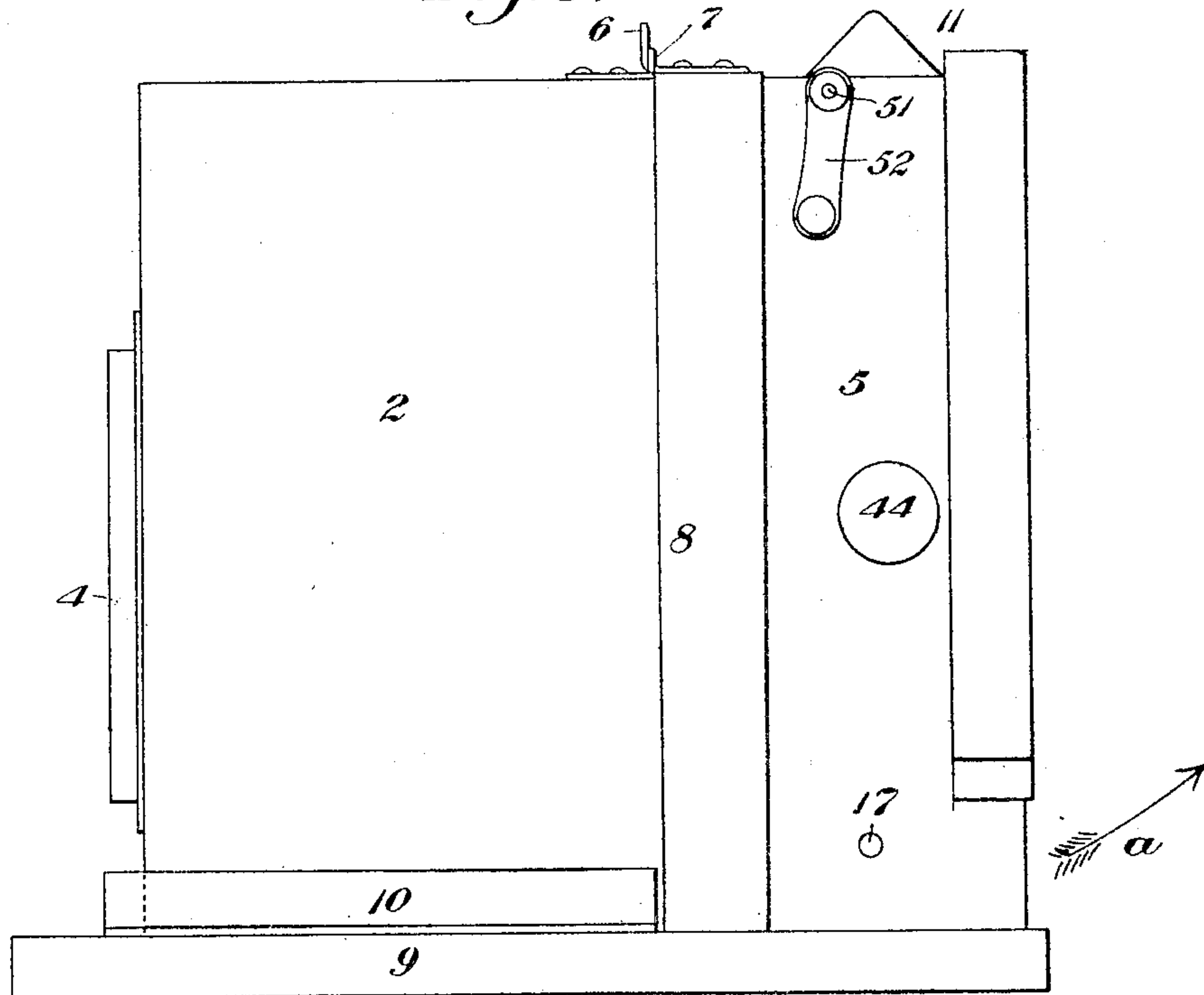


Fig. 4.

Witnesses  
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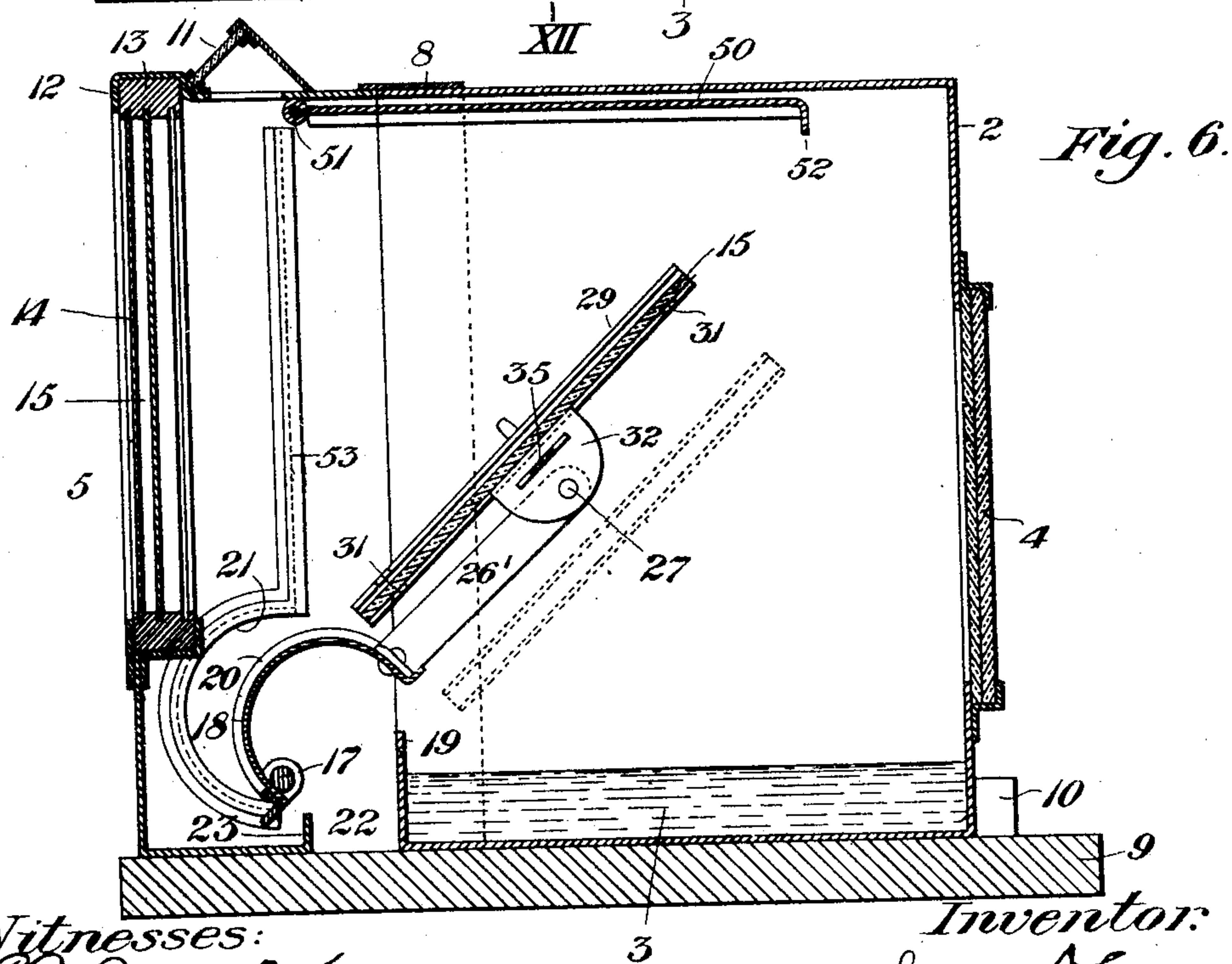
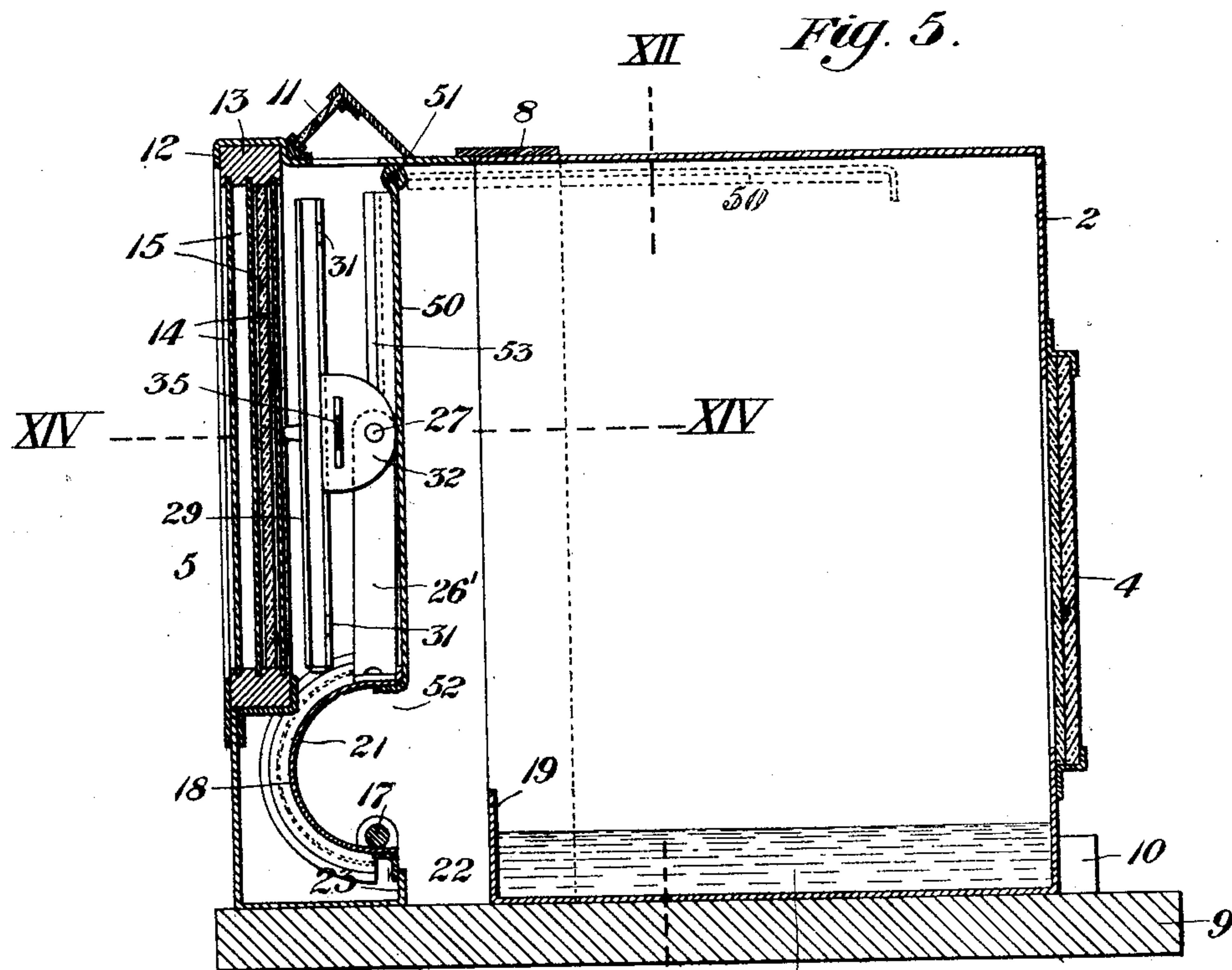
Inventor:  
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## DEVELOPING APPARATUS FOR PHOTOGRAPHIC PLATES.

APPLICATION FILED JUNE 30, 1903.

6 SHEETS—SHEET 3.



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DEVELOPING APPARATUS FOR PHOTOGRAPHIC PLATES.

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6 SHEETS—SHEET 5.

Fig. 12.

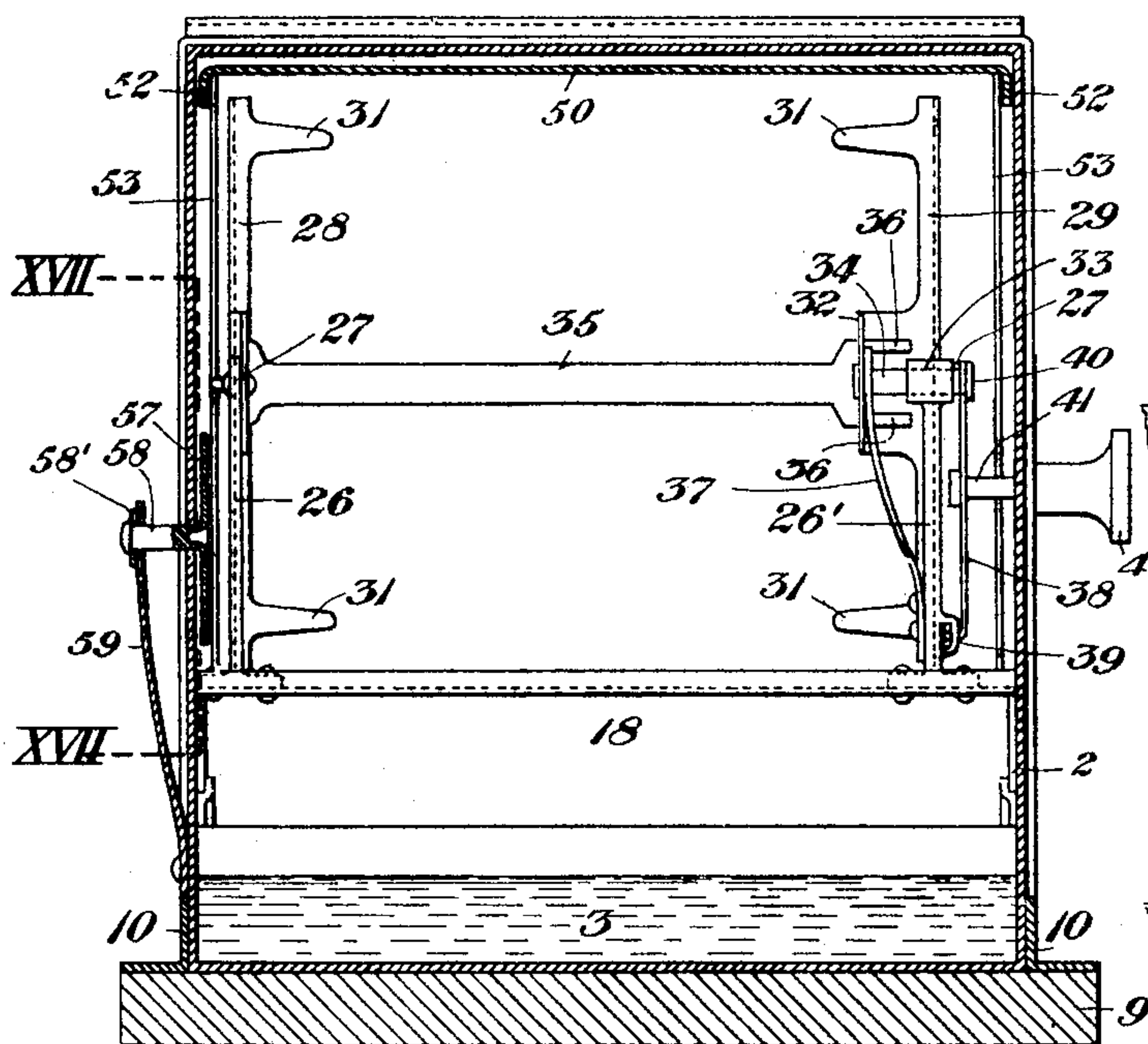


Fig. 13.

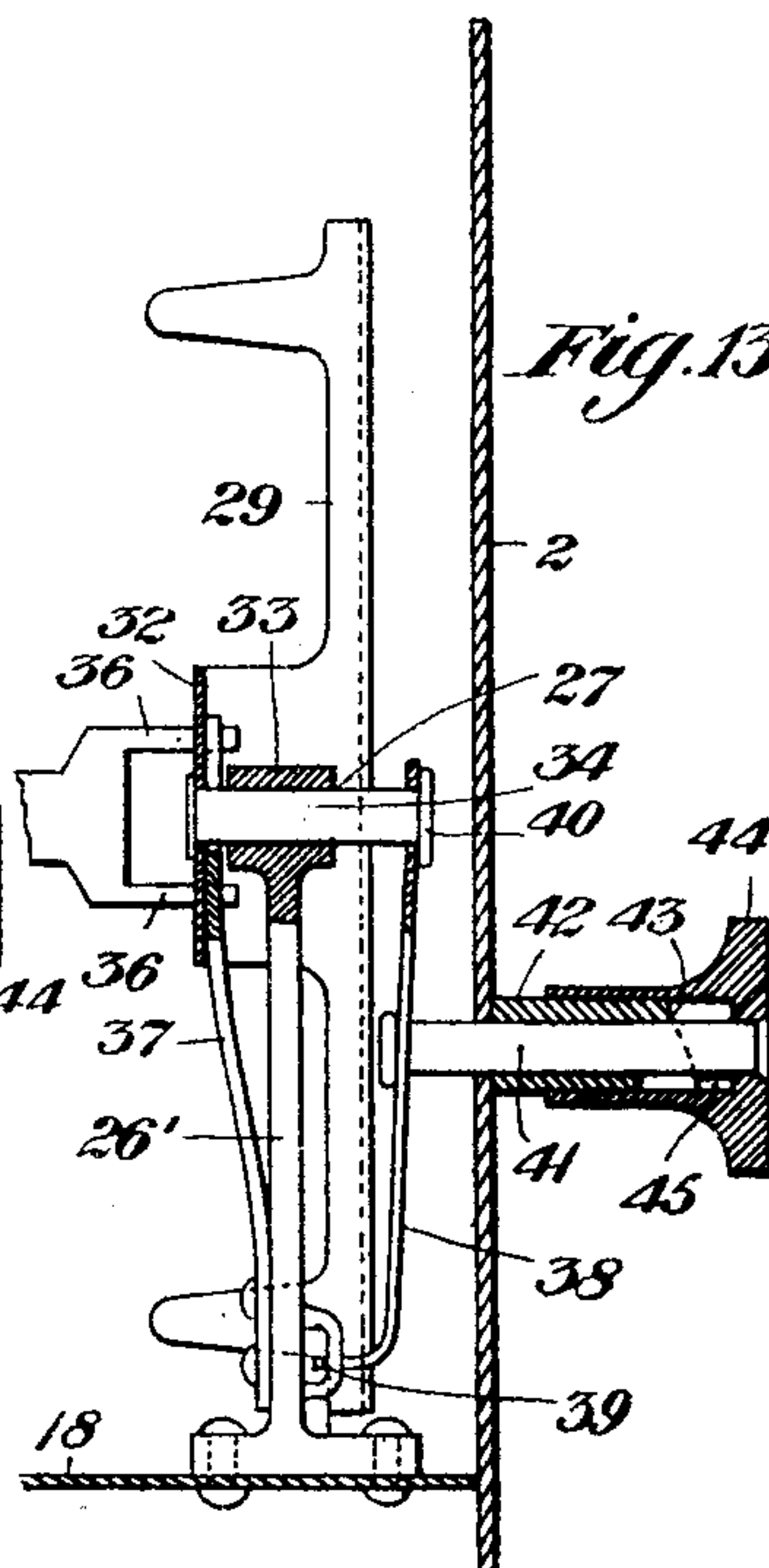


Fig. 14.

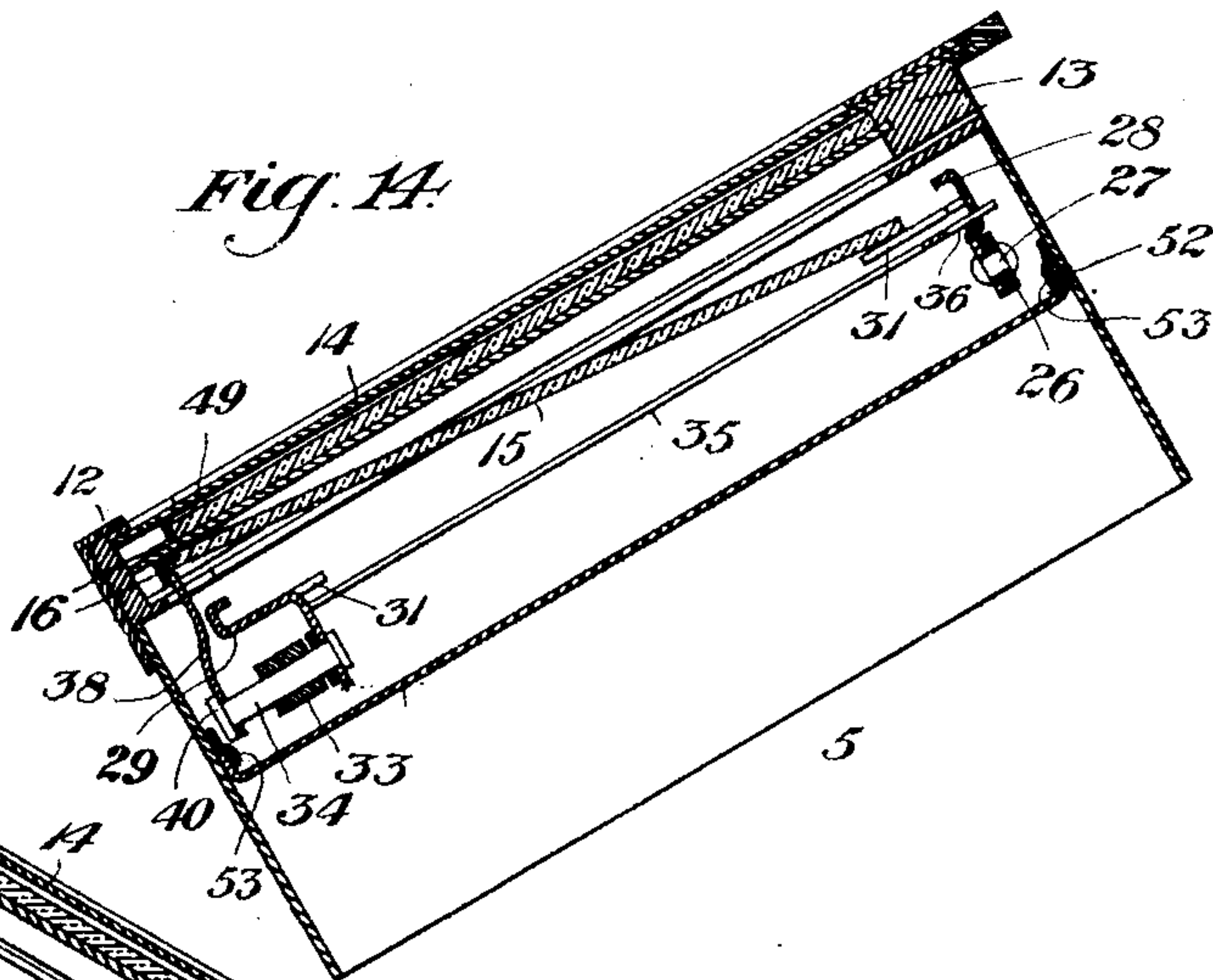
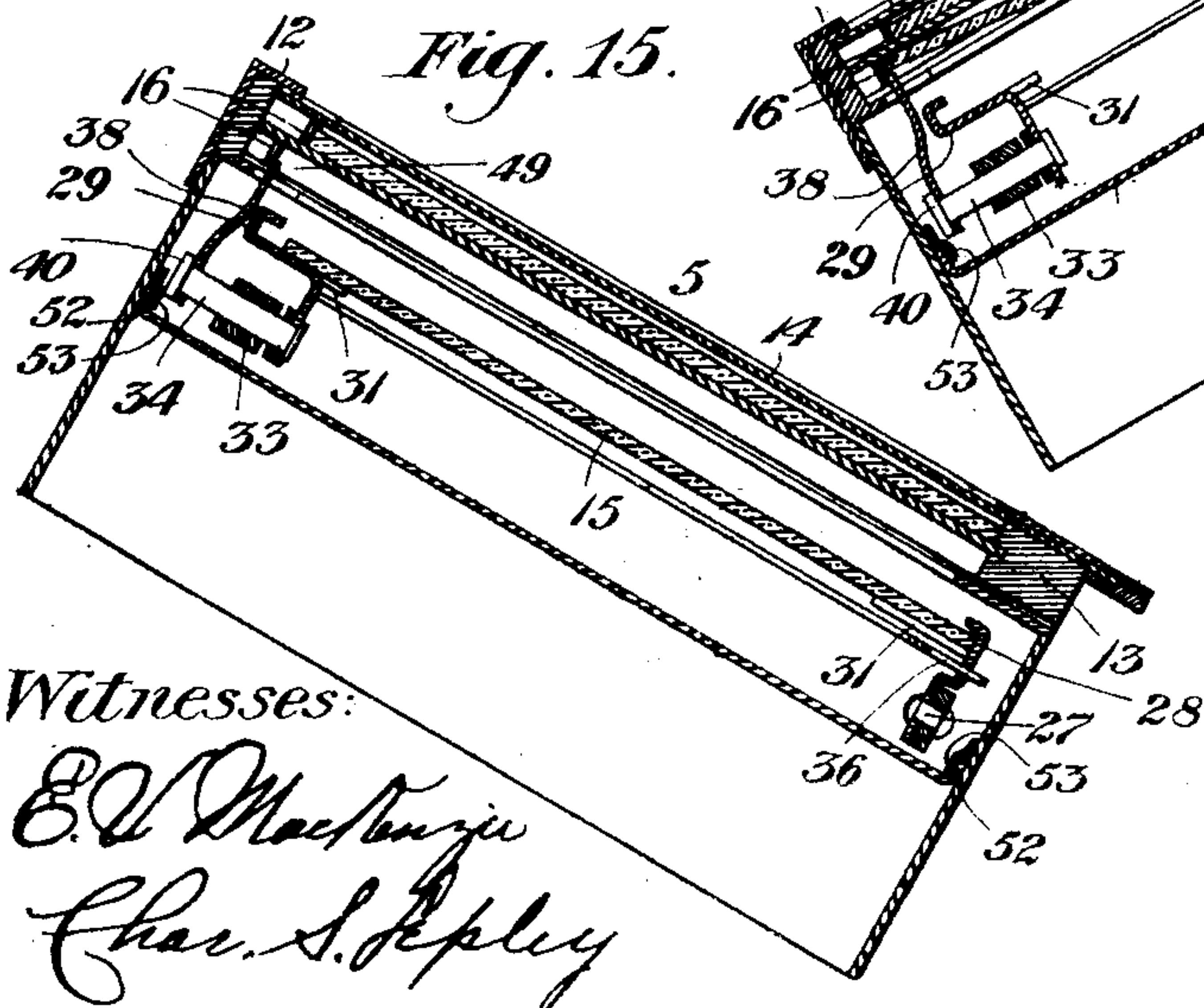


Fig. 15.



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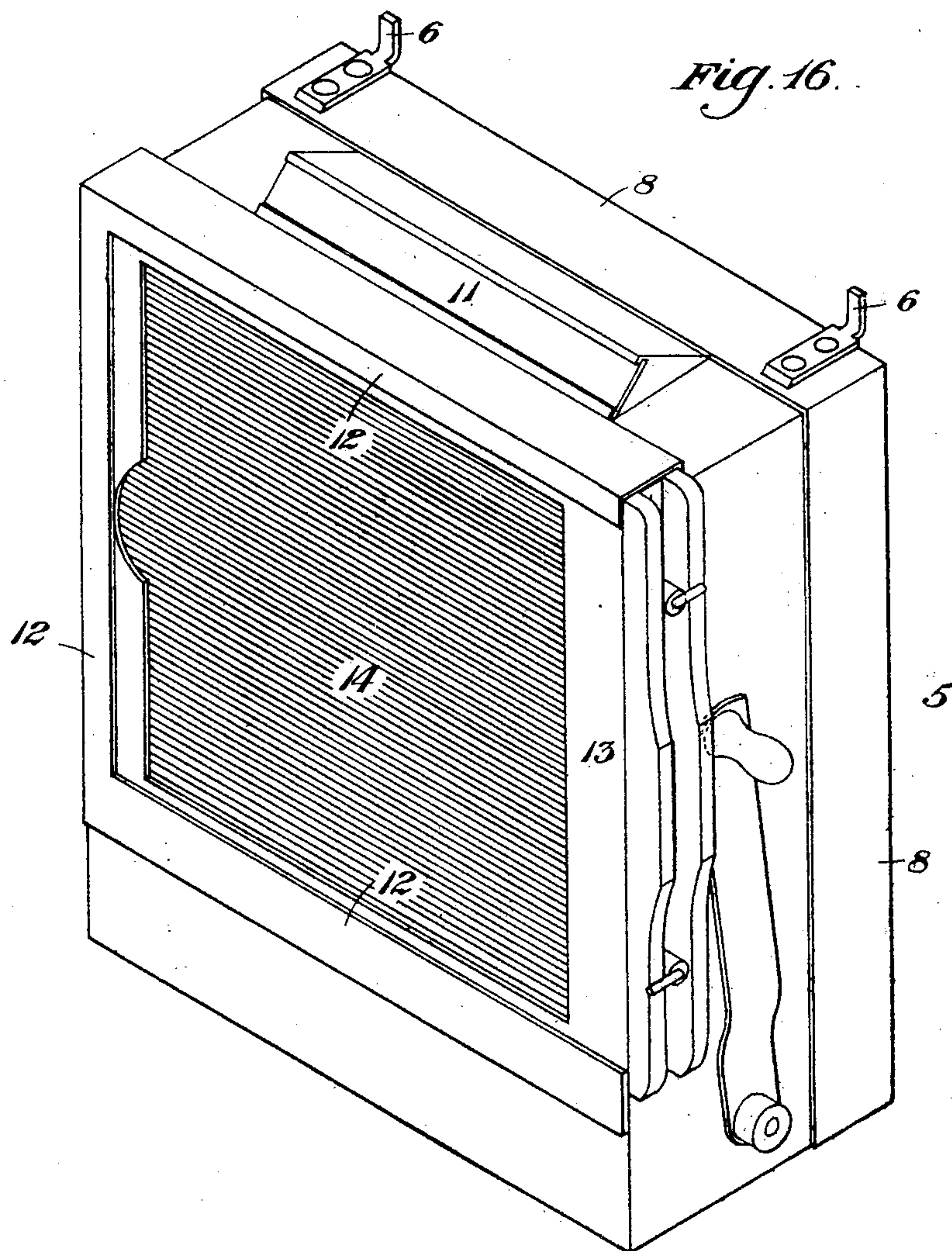
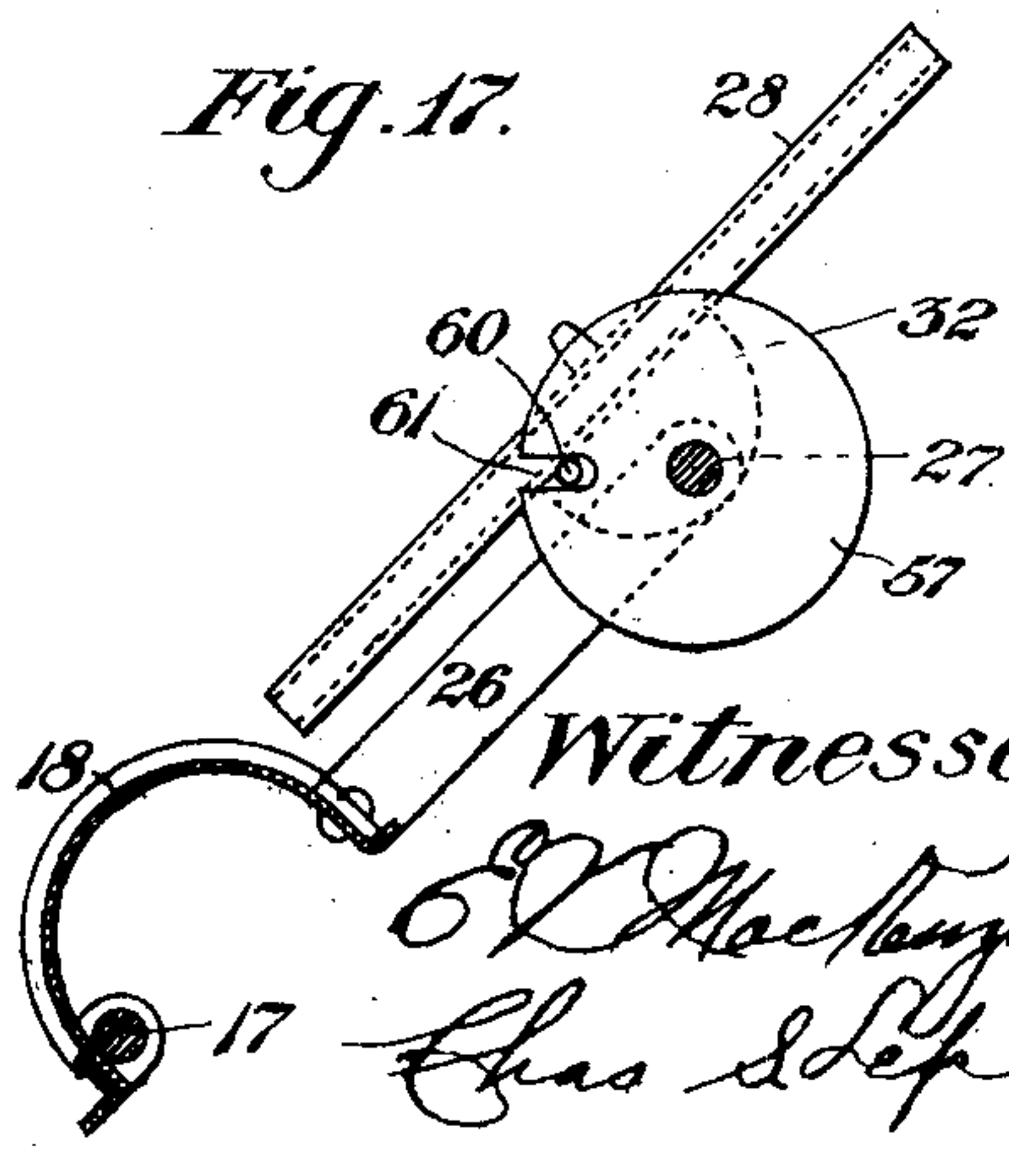


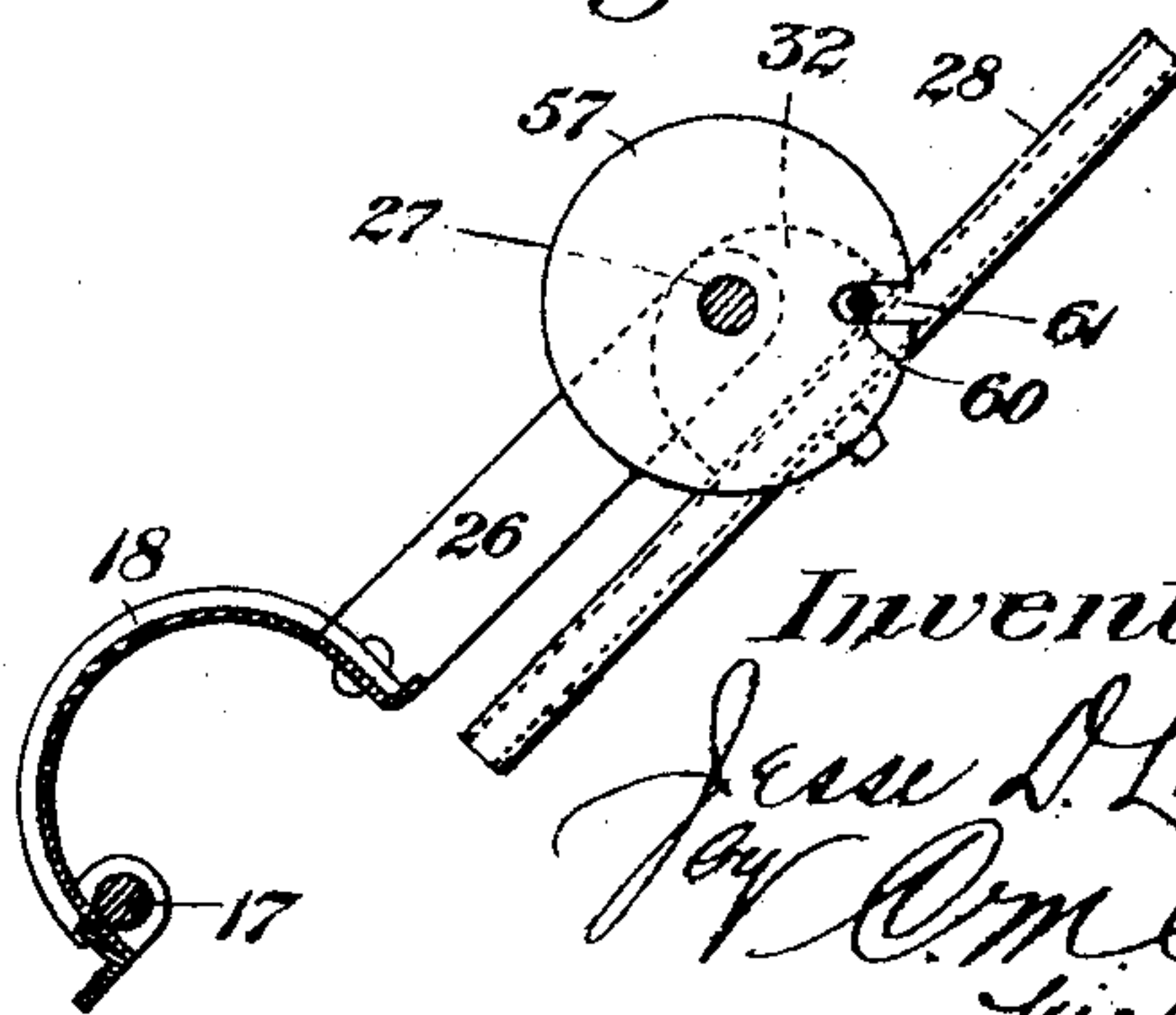
Fig. 17.



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Fig. 18.



Inventor:

*Jesse D. Lyon*  
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# UNITED STATES PATENT OFFICE.

JESSE D. LYON, OF PITTSBURG, PENNSYLVANIA.

## DEVELOPING APPARATUS FOR PHOTOGRAPHIC PLATES.

No. 799,571.

Specification of Letters Patent.

Patented Sept. 12, 1905.

Application filed June 30, 1903. Serial No. 163,813.

*To all whom it may concern:*

Be it known that I, JESSE D. LYON, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Developing Apparatus for Photographic Plates, of which the following is a specification, reference being had therein to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view in side elevation of my improved apparatus for handling and developing photographic plates. Fig. 2 is a plan view thereof. Fig. 3 is a view showing the plate-holder inserted. Fig. 4 is an end elevation showing the plate-holder inserted. Fig. 5 is a vertical longitudinal section on the line V V of Fig. 2, showing the parts of the apparatus in their initial position. Fig. 6 is a similar view showing the plate-holder partly lowered and in position for reversal, as indicated in dotted lines. Fig. 7 is a partial similar view showing the plate and holder after having been reversed and further lowered into the developing-bath. Fig. 8 is a similar sectional view showing the plate and holder again raised in position for discharging the plate into the fixing vessel, the fixing vessel having been inserted. Figs. 9 and 10 are detail views in perspective of a portion of the plate-carrier in its initial and reversed positions, respectively, together with portions of the actuating mechanism. Fig. 11 is a perspective detail view of the reversible pivoted plate-holder detached. Fig. 12 is a vertical cross-sectional view indicated by the line XII XII of Fig. 5. Fig. 13 is a sectional detail view of one end of the plate-holder, showing the spring-controlled mechanism for releasing it from pressure on the plate. Fig. 14 is a cross-sectional detail view of the detachable portion of the apparatus indicated by the line XIV XIV of Fig. 5 and showing the operation of inserting one side of the plate in the one end of the carrier. Fig. 15 is a similar view showing the apparatus tipped in opposite direction, completing the inserting operation, the other side of the plate having fallen into the holder. Fig. 16 is a perspective view, detached, of the removable portion of the apparatus containing the plate-holder and the pivoted carrier. Fig. 17 is a vertical sectional view on the line XVII XVII of Fig. 12, showing the rotating disk in engagement with the reversible carrier and in the

position corresponding to Fig. 9. Fig. 18 is a similar view showing the carrier in a position corresponding to Fig. 10.

My invention relates to improvements in apparatus for developing photographic plates or negatives independent of a dark room; and it consists of an inclosing box or receptacle adapted to receive an ordinary camera plate-holder and provided with a plate-carrier with means for removing the plate from the holder and into the carrier, securing it therein, manipulating and immersing it in a developing-bath, and removing it from the apparatus, together with means for effectually preventing entrance of light during the entire operation.

The present invention is similar in character to one for which I have filed a previous application bearing the Serial No. 139,511, and the objects in view in the present case have been to eliminate the light-proof hood and to render it possible to take the plate from the ordinary camera-holder and completely develop and fix it in one continuous operation.

Referring now to the drawings, 2 represents the main surrounding walls of a portion of the apparatus containing at its lower portion a developing-bath chamber 3 and provided at the front portion with one or more translucent ruby or other non-actinic panes 4.

5 is the movable portion of the device (shown in Fig. 16) provided with hooks or other suitable devices 6, adapted to interengage with corresponding eyes or loops 7 of the frame 2, and also with flanges 8, adapted to project over the side of the wall 2, whereby the removable section 5 may be swung upwardly in the direction of the arrow *a* in Fig. 3 and bodily removed from the other portion of the apparatus. When the two portions are assembled together, as shown in Figs. 1, 2, 3, 5, 6, and 8, they provide a complete inclosing light-proof chamber, and as thus assembled these portions comprise the complete apparatus and are conveniently set upon a supporting-base 9, provided with sides guides 10, between which the apparatus may slide back and forth, as will be readily understood. The removable section 5 is provided at its upper portion with a sight-opening having a non-actinic pane 11 so arranged that the interior of the case may be observed. The sight-opening is so located with relation to the pane 4 that the photographic plate may be observed when lowered into the developing-bath, as in Fig. 7, or when raised to the posi-



tion as shown in Fig. 6, turned and lowered to fall within the range of illumination of pane 4, the other side may be examined.

The interior of the case may be readily illuminated by light, either natural or artificial, entering through the pane 4 on the side opposite to the observer. The outer portion of the section 5 is provided with a plate-holder receiver having a cavity and retaining flanges or sides 12, into which cavity is inserted an ordinary plate-holder 13, having the usual removable slides 14 and adapted to contain the photographic plates 15. Each side of the holder, as is well understood, is provided with a spring 16 of a suitable form to hold the plate in position against the opposite edge of the holder, the plate being removed by compressing the spring, permitting it to fall toward the spring and out of the opposite groove, thus releasing such opposite edge, whereupon the entire plate readily falls out of the holder.

The section 5 containing the plate is provided with a plate receiver and carrier in such position and location with reference to the plate-holder and provided with mechanism for the purpose, so that the spring 16 may be depressed and the plate discharged into the receiver and carrier and by it thereafter manipulated through the ensuing steps of the operation.

17 is a rod pivotally mounted in the sides of the case, to which rod is secured a coping or shield 18, adapted to close down over the upwardly-extending inner wall 19 of the developing-bath 3, and also provided at each end with flanges 20, adapted to interfit with the corresponding receiving-flanges 21. The light is thus cut off from the outside when case 5 is detached. This vessel is provided with flanges 25, extending along its sides and ends, and is adapted to entirely fill the space between the walls 19 and 23 and between the sides of the case and when thus inserted fills the space and will effectually cut off the light from entering to the interior. The coping 18 is practically rigid and unyielding and forms a base to which are secured the bracket-arms 26 26', to which at 27 27 are pivoted the end holding-arms 28 29, adapted to receive the edges of the plate 15. These holders are U-shaped in cross-section, providing inwardly-disposed grooves 30, adapted to receive the plate edges, and on one side are provided the inwardly-extending fingers or flanges 31. In the normal position of the carrier, as in Fig. 5, these fingers are on the side beyond the plate, so as to receive it when it is dropped into the receiver, as illustrated in Figs. 14 and 15. Each of the holding-arms is provided with backwardly-extending flanges or lugs 32, so that the pivotal bearing 27 is located beyond the plane of the plate, permitting it to be turned on said bearing in the holder around said center, as indicated in Fig. 6. One of the holding-arms, as 28, is merely pivoted to the bracket-arm 26, while

bracket-arm 26' is provided at its upper portion with an elongated bearing 33, in which bearing the pin 34, to which the lug 32 of arm 29 is pivoted, may slide. Rigidly connected to arm 28 is a cross-bar 35, provided with terminal pins 36, extending through lugs 32, by which construction the carrier 29 may slide outwardly, remaining parallel with the opposite carrier 28 on pin 34, while its alinement is maintained. The carrier 29 is normally pressed inwardly by a spring 37, bearing against lug 32, as clearly shown in Fig. 12, thus holding the carrier in binding position with relation to the opposite arm 28, so as to always grip the edges of the plate. For the purpose of drawing arm 29 outwardly to permit the plate to fall into position I have provided a movable clevis-arm 38, loosely connected at the base of bracket 26', as at 39, and engaging an outer flange 40 of pin 34.

A withdrawing-stem 41 is mounted in a bearing 42, secured to the side of the case 2, said bearing having an inclined cam-face 43 at its outer end, while a turning button 44, secured at the outer end of stem 41, is provided with a pin or abutment 45, adapted to ride upon said cam-face and to cause stem 41 to travel outwardly as the button 44 and the stem are rotated. In Fig. 13 this construction is fully illustrated, the button having been turned so that the abutment 45 is resting on the highest point of the cam, having by the connection with the clevis-arm 38 withdrawn the pin 34 against the pressure of the spring 37. Further turning movement of the button will cause it to be released from the cam, falling back to the lowermost point, or the same effect may be produced by reversing the button, whereby the arm 29 is caused to travel by spring 37 toward the edge of the plate, grasping it and forcing the opposite edges into the receiving-groove of arm 28. The plate will then be firmly held during the manipulation of the apparatus unless released by again turning the button. The clevis 38 is provided with inwardly-projecting lugs 46 and an intervening slot 47, adapted to engage stem 41 when the carrier-arms are thrown up into receiving position, the stem 41 being provided on its inner end with a button 48, by which the clevis-arm is engaged and may be drawn out. The clevis-arm is also provided at its upper terminal with an inwardly-extending finger 49, which in the same position extends in front of the spring 16 of the plate-holder and is adapted to bear against and depress it when the clevis-arm 38 is drawn out.

50 is a cover-plate secured to a rod 51, pivoted in the upper portion of the sides of the case and provided on one side with the turning crank or handle 52, so that it may be raised out of the way of the plate-carrier, as indicated in dotted lines in Fig. 5. This cover-plate is provided with flanges 52 around its bottom and sides, adapted to interfit with the



edges of the coping 18, and with receiving flanges 53 in the sides of the section 5, as shown in Figs. 5, 14, and 15, so that when closed down in front of the plate-carrier, as in Fig. 5, the entire section 5 may be bodily removed and all light will be excluded from the plate. The inner slide having been removed from the plate-holder, it is then held by the operator in a horizontal position and tipped downwardly at the left side, as shown in Fig. 14, the arm 29 having been retracted, by which operation the finger 49 draws back the spring 16, releasing pressure on the edge of the plate 15, allowing it to fall downwardly against and upon the finger 31 of arm 28. This operation is facilitated by inclining the section downwardly toward the left, as shown in Fig. 14. If the inclination of the section is then reversed, as in Fig. 15, the plate will slide downwardly upon the supporting-fingers, causing the opposite edges to drop out of the plate-holder and upon the corresponding finger of the receiver 29. The stem 41 is now retracted by turning the button 44, whereby upon the arm 29 travels inwardly, gripping the edges of the plate and forcing it into the groove of the opposite arm 28, whereby it is firmly held by both arms. The section 5 is now replaced and attached to the main casing 2, and the shield 50 is turned upwardly, as shown in Fig. 6, and the supporting arms and framework of the plate-carriers with the plate are turned downwardly to the position shown in said figures. The turning operation is performed by a crank-arm 54, secured to the outer end of rod 17 at one end of the section 5. The crank-arm 54 is somewhat resilient, and the center of its handle 55 corresponds at all times to the pivotal center 27, so that by turning the stem 17 by the crank these parts will always maintain the same relative position and move in the same arc around the pivotal center 27. Pivotaly mounted at a point 56 in the same arc is a stem 58, having on its inner extremity inside the walls 2 a flat thin disk 57, provided at its outer extremity with a turning-crank 58', while a spring 59, engaging stem 58 underneath the crank, normally holds the stem and disk outwardly beyond the range of the swinging carrier. The carrier 28 is provided at its outer side with a pin 60, eccentrically located as to the pivotal center 27, while the disk 57 is provided with a slot 61, normally in position to receive the pin 60 as the plate-carriers are thrown downwardly to the intermediate position of Fig. 6. During such turning operation the resilient crank 54, being of flat spring material, is normally pressed inwardly and may be held outwardly, so as to pass the outer end of the stem 58, and when located in register with it and released will press the disk inwardly, so as to insure engagement by slot 61 with pin 60. If the slot is not in position to register with the pin, the disk may be turned to the right

or the left by the crank 58 and will travel inwardly over the pin, bringing the slot into register. The crank 58 is now turned around, approximately a half-rotation, to the position indicated in Fig. 10, thus rotating the plate-carrier and plate around to the position shown in dotted lines in Fig. 6. The purpose of such operation is to bring the plate into proper position for immersion into the developing-bath within the chamber 3. Further travel of the carrier imparted by crank 54 then lowers the plate downwardly within the bath, as shown in Fig. 7, in which position it is allowed to remain until developed. It may be raised from time to time above the liquid and observed through the sight-opening, so as to allow the light from pane 4 to fall upon it, as already described. It may also be lowered into the developing-bath as frequently as desired, and when the plate is finally developed to the satisfaction of the operator it is ready for immersion in the fixing-bath. The apparatus is conveniently mounted so as to slide upon the supporting-base 9 of any convenient form, provided with the slides 10, between which the case may be moved outwardly beyond the edge of the base 9, and it will thus be seen that while resting upon the base all light is shut off from the interior by thus covering the opening 22. While the plate is still lowered into the developing-bath, the apparatus is moved outwardly, so as to bring the opening 22 beyond the edge of the base, when the fixing-bath chamber 24 is inserted upwardly, completely filling the opening 22, shutting off the light, and in position to receive the developed plate. The plate is then raised vertically above the fixing-bath, as shown in Fig. 8, and arm 29 is drawn backwardly, as already described, releasing the plate, which then falls downwardly into the fixing-bath. The operation is now complete, and the plate may be removed by removing the fixing-bath, or a number of the plates may be successively dropped into it until full. The operation may be then repeated as often as desired, it being merely necessary to reverse the plate-holder to insert a new one. It will be understood that the plates may be removed from the apparatus and fixed in any other suitable vessel or manner, and I do not desire to be limited to this specific portion as a necessary element of the invention, although I have found it very convenient in practice.

The apparatus will be found to be very convenient and efficient in operation. It is comprised within very small compass. It is simple, durable, and reliable in operation, and entirely dispenses with the necessity of the usual dark room or any hand manipulation of the plate.

It will be understood that various changes or modifications may be made in the details of construction by the skilled mechanic, as



by substituting various other means for holding, moving, and releasing the plate; but all such changes are contemplated as within the scope of the invention as covered by the following claims:

What I claim is—

1. A developing apparatus for photographic plates consisting of a light-proof casing provided with a developing-bath; and unitary means for removing a plate from the plate-holder, and immersing it downwardly in the bath, substantially as set forth.

2. A developing apparatus for photographic plates consisting of a light-proof casing provided with a developing-bath; and unitary means for removing a plate from a plate-holder, turning it, and immersing it in the bath, substantially as set forth.

3. A developing apparatus for photographic plates consisting of an inclosing light-proof case provided with a developing-bath and observation-windows, a plate-holder receiver and means for removing the plate from the plate-holder and immersing it downwardly in the bath, substantially as set forth.

4. A developing apparatus for photographic plates consisting of an inclosing light-proof case provided with a developing-bath and observation-windows, a plate-holder receiver, and means for removing the plate from the plate-holder and immersing it downwardly in the bath, with means for removing the plate from the apparatus, substantially as set forth.

5. A developing apparatus for photographic plates consisting of an inclosing light-proof case provided with a developing-bath, a plate-holder receiver, and a pivoted frame provided with clamping-arms, with means for removing the plate from the plate-holder, substantially as set forth.

6. A developing apparatus for photographic plates consisting of an inclosing light-proof case provided with a developing-bath, a plate-holder receiver, a pivoted frame provided with clamping-arms, and means for removing the plate from the plate-holder, with means for reversing the plate, substantially as set forth.

7. A developing apparatus for photographic plates consisting of a case provided with a developing-bath, and a detachable case adapted to form an extension thereof, and provided with means for holding a plate-holder, with means for removing the plate from the holder and immersing it in the bath, substantially as set forth.

8. In a developing apparatus, a plate-carrier consisting of oppositely-disposed arms having grooves and supporting-fingers with means for adjusting one of the arms with relation to the other, substantially as set forth.

9. In a developing apparatus, a plate-carrier consisting of oppositely-disposed arms, means for adjusting one of the arms with relation to

the other, and means for pivotally reversing both of the arms, substantially as set forth.

10. In a developing apparatus, a plate-carrier consisting of a pivoted light-shield provided with supporting-brackets, plate-holding arms pivotally secured in such brackets, and means for adjusting one of the arms with relation to the other, substantially as set forth.

11. In a developing apparatus, a plate-carrier consisting of a pivoted light-shield provided with supporting-brackets, plate-holding arms pivotally secured in said brackets and means for adjusting one of the plate-carriers with relation to the other, with means for reversing both of the carrier-arms on their bearings, substantially as set forth.

12. In a developing apparatus, a plate-carrier consisting of a pivoted light-shield provided with supporting-brackets, plate-holding arms pivotally secured in said brackets and means for adjusting one of the plate-carriers with relation to the other, with means for engaging the spring of a plate-holder, substantially as set forth.

13. In a developing apparatus, a plate-carrier consisting of a pivoted light-shield provided with supporting-brackets, plate-holding arms pivotally secured in such brackets and means for adjusting one of the plate-carriers with relation to the other, with means for engaging the spring of a plate-holder and means for protecting the plate from the light, substantially as set forth.

14. In a developing apparatus, a detachable light-proof casing provided with a plate-holder cavity a plate-carrier and means for removing the plate from the holder and securing it in the carrier, substantially as set forth.

15. In a developing apparatus, a removable casing provided with a plate-holder cavity, a pivoted frame provided with a plate receiver and carrier, and an adjustable light-proof cover-plate, substantially as set forth.

16. In a developing apparatus, the combination of an inclosing case provided with a developing-bath, a removable section provided with a plate-holder cavity, means for removing the plate from the holder and for immersing it in the bath, and means for partially rotating the plate in its travel from the plate-holder toward the developing-bath, substantially as set forth.

17. A developing apparatus for photographic plates consisting of a main case provided with a developing-bath and a light-aperture; a removable casing provided with a plate-holder cavity, a plate-carrier, and a light-aperture; with means for incorporating said portions so as to form one complete light-proof apparatus, substantially as set forth.

18. The combination of a main casing provided with a developing-bath, a light-aperture, and means for turning the plate-carrier, with a removable section provided with a plate-



holder cavity, a light-aperture, a pivoted plate-carrier, and a cover-plate, substantially as set forth.

19. The combination of a main casing provided with a developing-bath, a light-aperture and means for turning the plate-carrier; with a removable section provided with a plate-holder cavity, a light-aperture, a pivoted plate-carrier, means for manipulating the plate-carrier to remove a plate from a holder thereinto, means for moving the plate-carrier, and means for protecting it from the light, substantially as set forth.

20. The combination of a main casing provided with a developing-bath, a light-aperture, and means for turning the plate-carrier, with a removable section provided with a plate-holder cavity, a light-aperture, a pivoted plate-carrier and a cover-plate; and a fixing-bath vessel adapted to be inserted between the sections, substantially as set forth.

21. In a developing apparatus, a rotatable disk provided with a slot, adapted to engage the pin of a plate-carrier, and means for turning the disk, substantially as set forth.

22. In a developing apparatus, the combination of an inclosing case provided with a developing-bath, a removable section adapted to receive a plate-holder, and means for removing a plate from the holder and dipping it into and out of the bath, substantially as set forth.

23. A developing apparatus for photographic plates consisting of a light-proof casing provided with a developing-bath and a plate-holder receiver, and means for removing

a plate from a holder, positively grasping it, and immersing it in the bath, substantially as set forth.

24. A developing apparatus for photographic plates consisting of a light-proof casing provided with a developing-bath and a plate-holder receiver, and means for removing a plate from a holder, and for positively grasping and manipulating the plate within the interior of the casing, substantially as set forth.

25. The combination, in an apparatus of the class described, of a tank adapted to exclude actinic light, a carrier pivotally mounted within said tank, and a spring-actuated device mounted thereon arranged to normally press inwardly under the spring action to grip against the edge of a photographic plate when mounted in the carrier.

26. The combination, in an apparatus of the class described, of a tank adapted to exclude actinic light, a carrier pivotally mounted within said tank, and a spring-actuated device mounted thereon arranged to normally press inwardly under the spring action to grip against the edge of a photographic plate when mounted in the carrier, with means for retracting the spring-actuated device to release the plate.

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

JESSE D. LYON.

Witnesses:

JAS. J. McAFEE,  
CHAS. S. LEPLEY.