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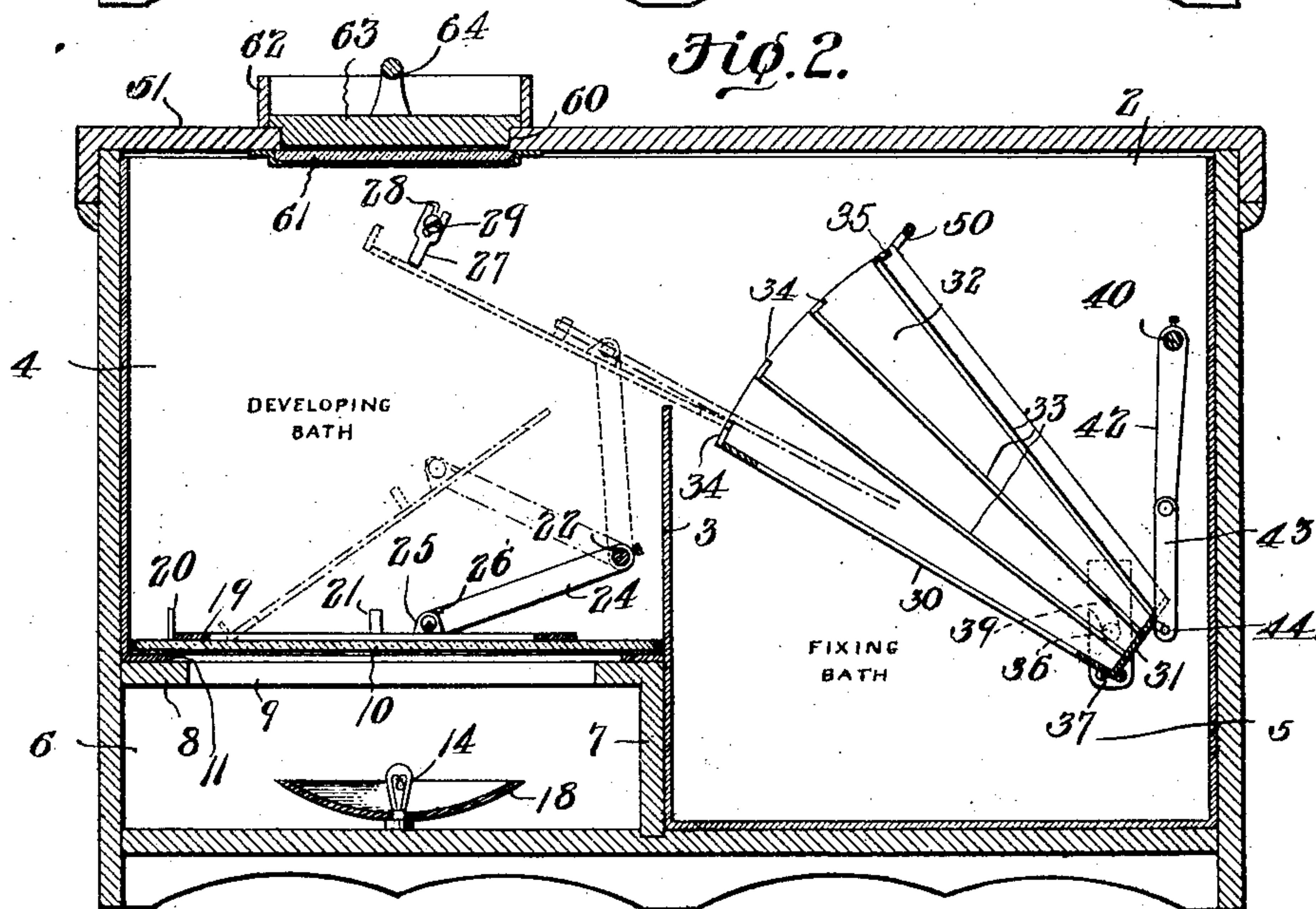
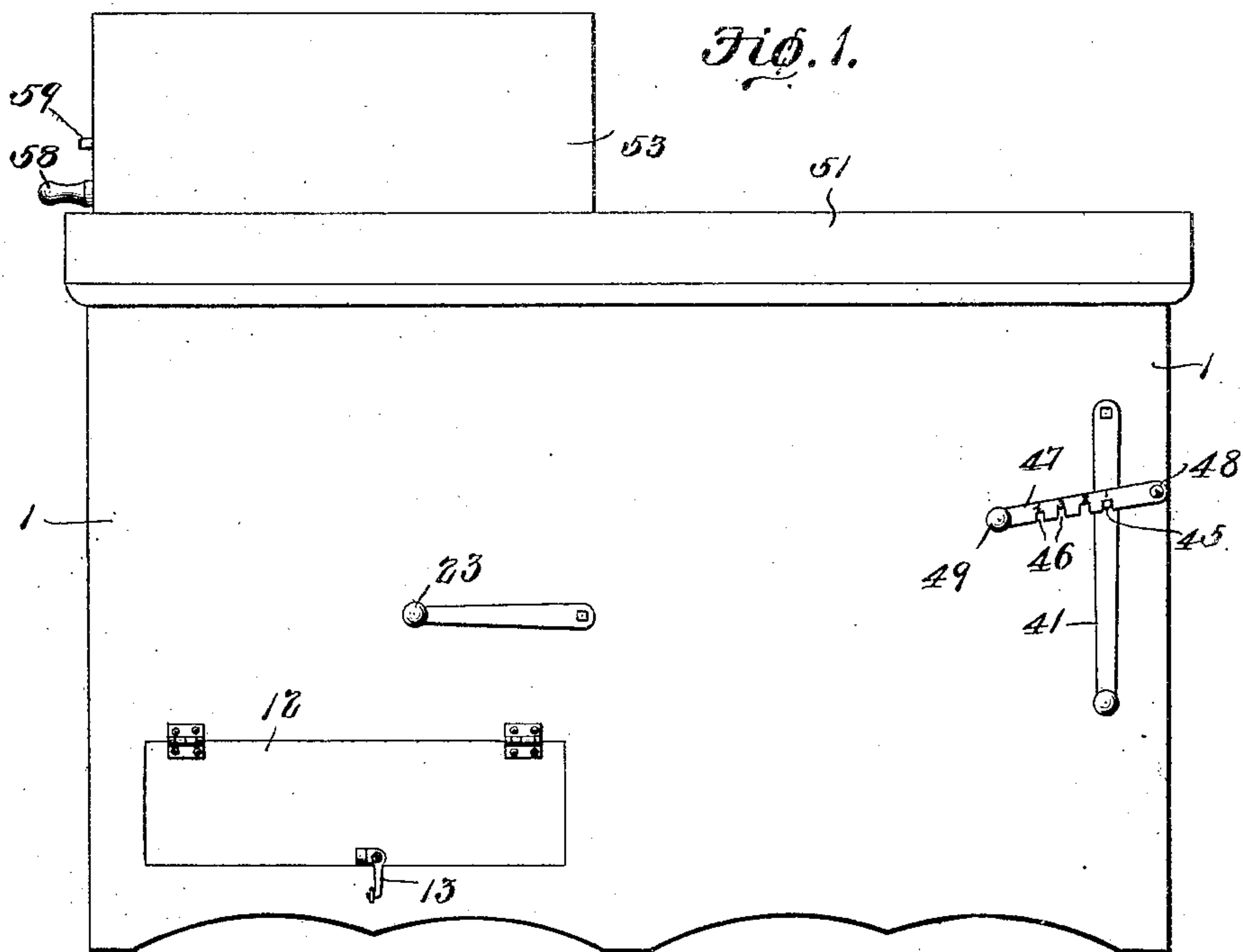
PATENTED MAY 28, 1907.

A. C. HAYDEN.

PHOTOGRAPHIC DEVELOPING AND FIXING APPARATUS.

APPLICATION FILED FEB. 2, 1906.

3 SHEETS—SHEET 1.



WITNESSES:

E. J. Stewart
H. A. Shepard.

Arthur C. Hayden, INVENTOR

By

Chas Knowlton

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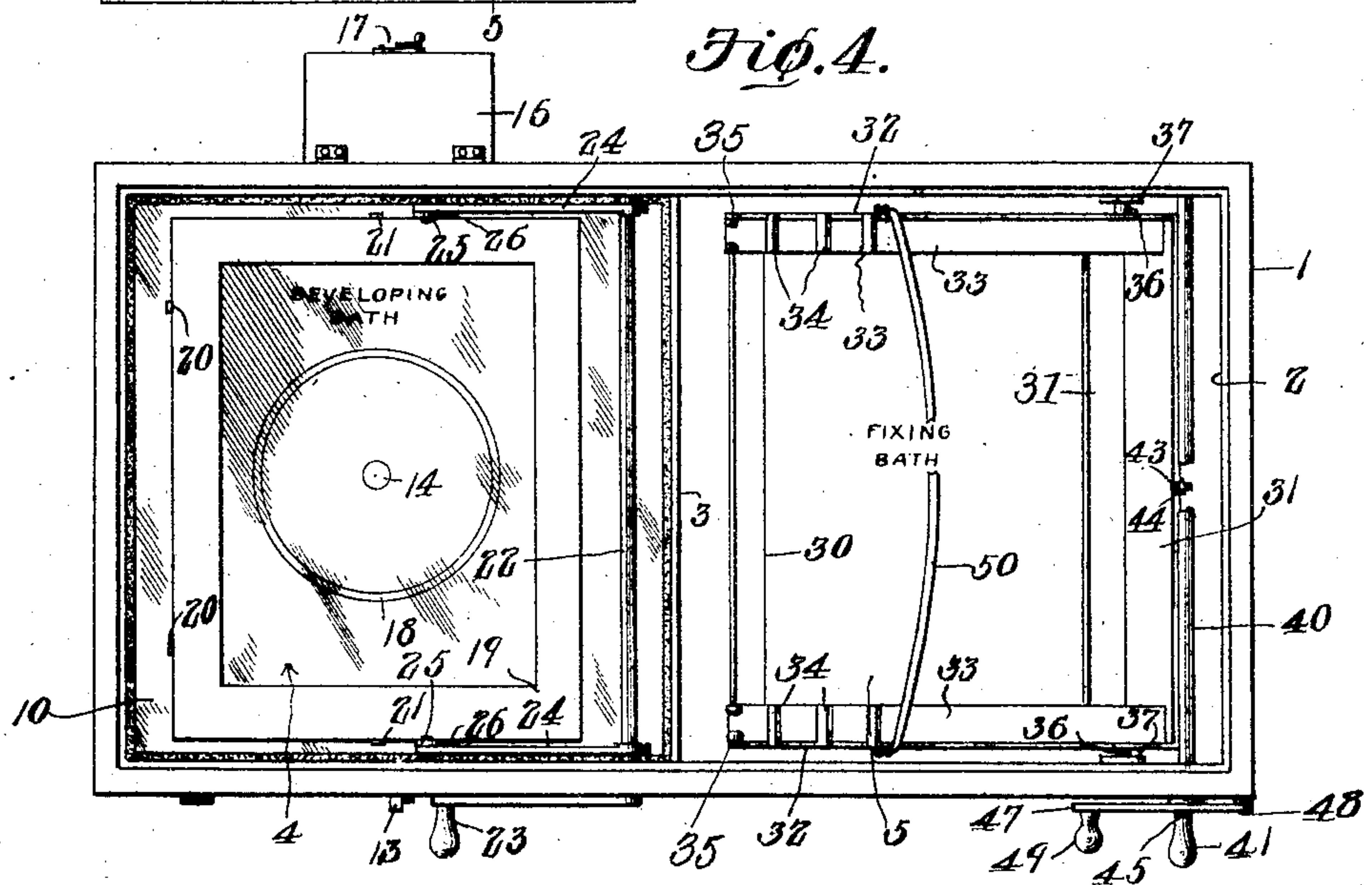
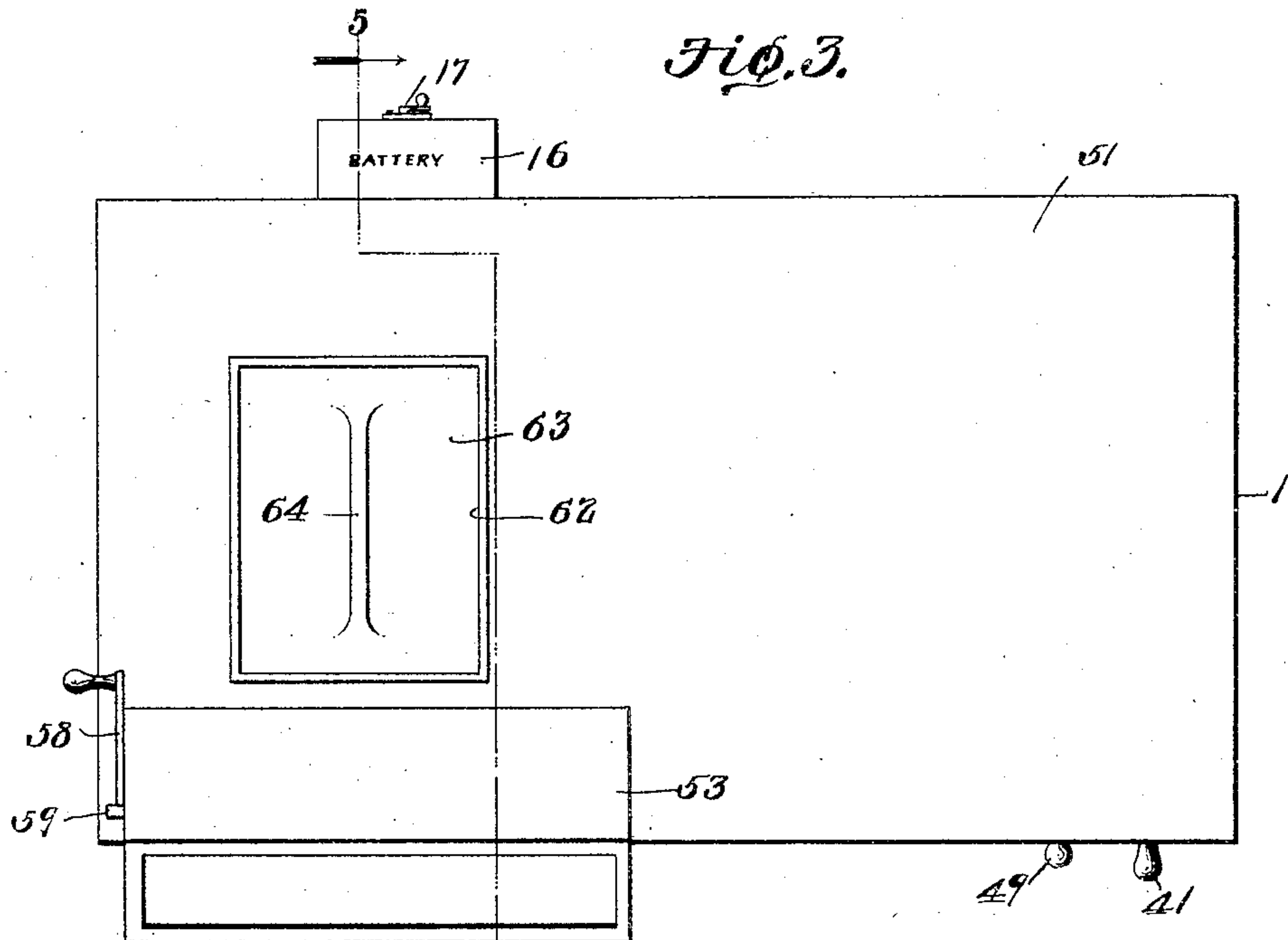
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3 SHEETS—SHEET 3.

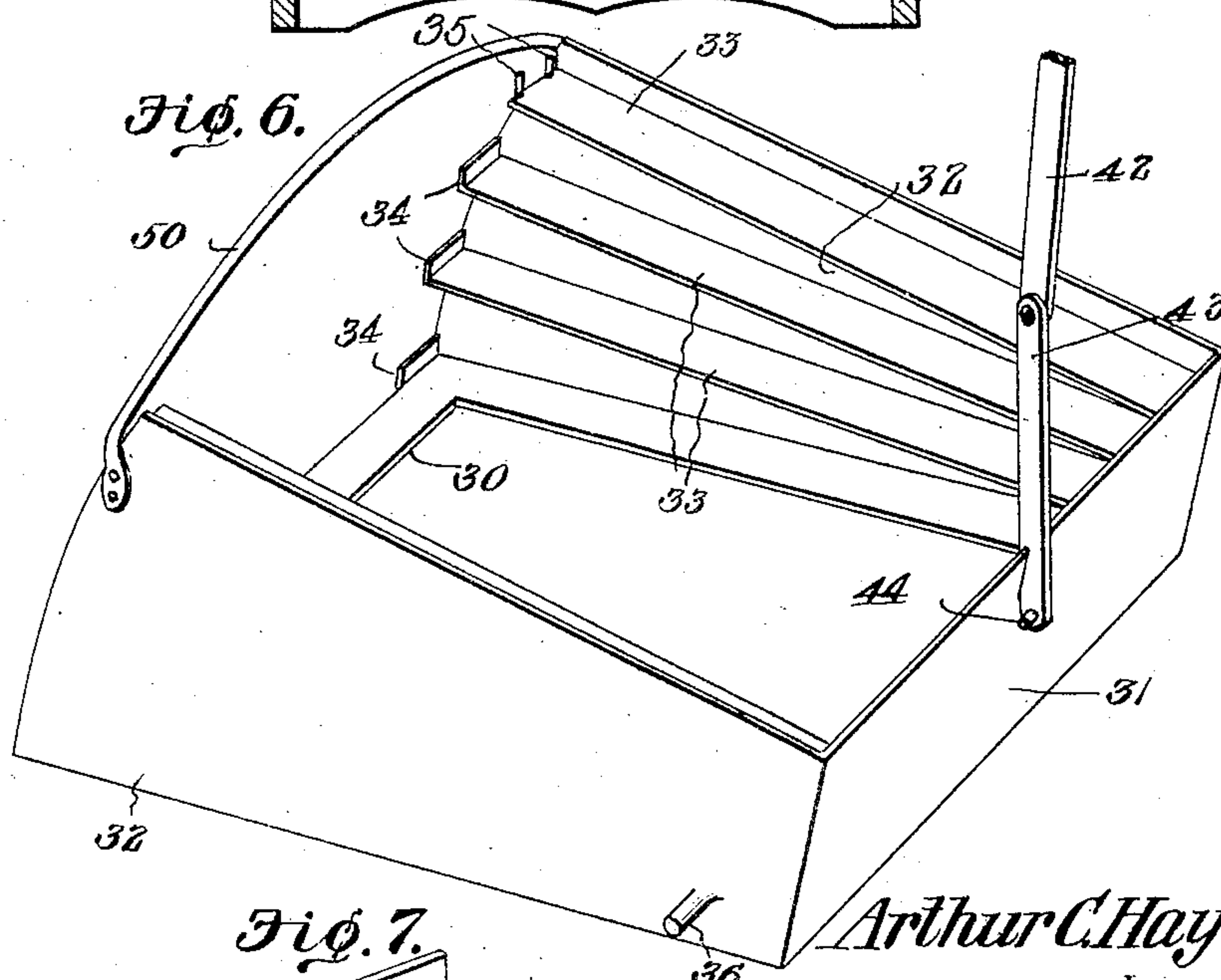
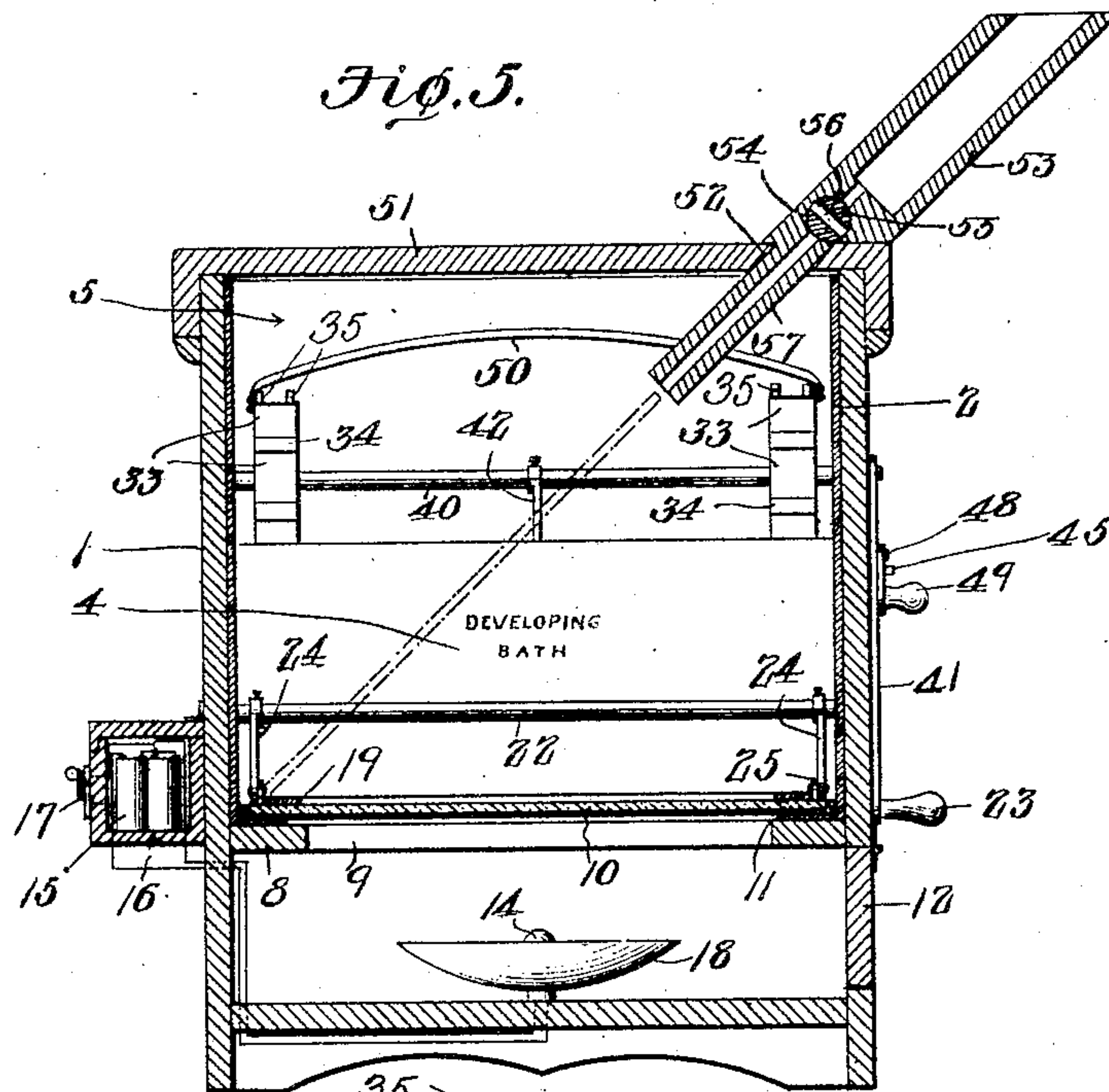
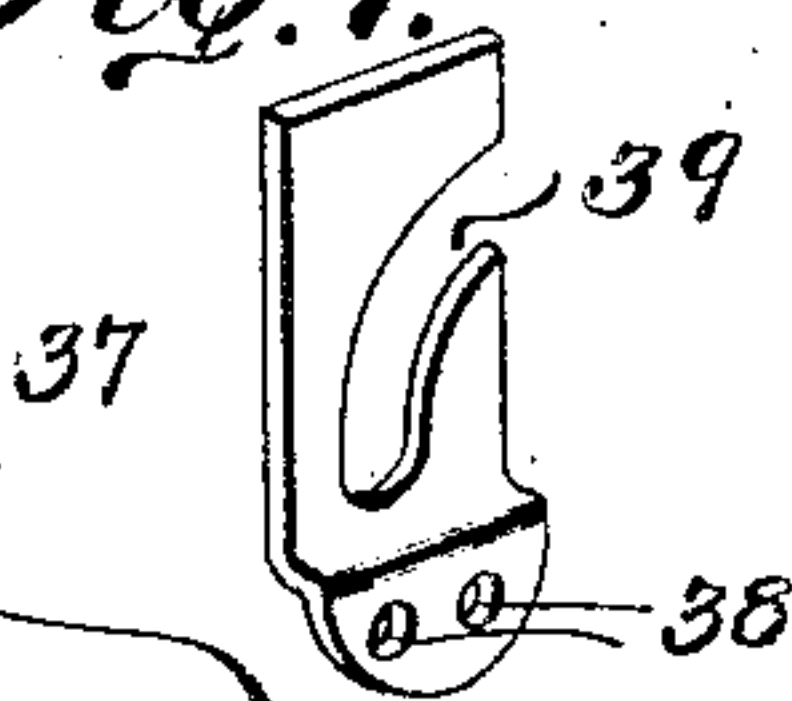


Fig. 7.

WITNESSES:

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UNITED STATES PATENT OFFICE.

ARTHUR CLARENCE HAYDEN, OF BROCKTON, MASSACHUSETTS, ASSIGNOR
TO HAYDEN PHOTOGRAPHIC MANUFACTURING COMPANY, OF BROCK-
TON, MASSACHUSETTS.

PHOTOGRAPHIC DEVELOPING AND FIXING APPARATUS.

No. 855,402.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed February 2, 1906. Serial No. 299,205.

To all whom it may concern:

Be it known that I, ARTHUR CLARENCE HAYDEN, a citizen of the United States, residing at Brockton, in the county of Plym-outh and State of Massachusetts, have in-vented a new and useful Photographic De-veloping and Fixing Apparatus, of which the following is a specification.

This invention relates to the art of develop-
ing photographic plates, and has for its prime
object to enable the developing and fixing
of the plates without recourse to a dark
room.

It is furthermore designed to permit the
convenient observation of the plate while de-
veloping, without exposing the same to ac-
tinic rays, and to enable the convenient
transfer of the plate from the developing
bath to the fixing bath without removing the
plate from the case of the apparatus.

It is also proposed to arrange the apparatus
for the successive treatment of several plates
without requiring the individual removal
thereof for the reception of another plate.

Another object of the invention is to equip
the device with a source of artificial light for
use in viewing the developing of the plates at
night.

With these and other objects in view, the
present invention consists in the combina-
tion and arrangement of parts as will be here-
inafter more fully described, shown in the
accompanying drawings and particularly
pointed out in the appended claims, it being
understood that changes in the form, propor-
tion, size and minor details may be made,
within the scope of the claims without depart-
ing from the spirit or sacrificing any of the
advantages of the invention.

In the drawings: Figure 1 is a side eleva-
tion of a developing apparatus of the present
invention. Fig. 2 is a longitudinal sectional
view thereof. Fig. 3 is a top plan view of the
apparatus. Fig. 4 is a similar view with the
cover removed. Fig. 5 is a cross sectional
view on the line 5—5 of Fig. 3. Fig. 6 is a
detail perspective view of the holder for sup-
porting a plurality of plates in the fixing
bath. Fig. 7 is a detail perspective view of
one of the brackets for the pivotal support of
the plate holder.

Similar numerals of reference designate

corresponding parts in all of the figures of the
drawing.

In carrying out the present invention, I
employ a case 1, preferably of wood and
rectangular or oblong in form. By prefer-
ence, the width of the case should slightly
exceed the length of the standard plate which
it is designed to develop, and the length of
the case should slightly exceed twice the
width of the plate in order that the plate
may be carried from the developing bath to
the fixing bath. Within the case and snugly
fitting the same, is a metallic box or lining 2,
from the bottom of which rises a transverse
partition 3 located substantially midway be-
tween the ends of the lining and terminating
short of the top thereof, whereby the box or
lining is divided into a compartment 4 to
contain the developing bath, and a compart-
ment 5 for containing the fixing bath. The
bottom of the compartment 4 is elevated
somewhat above the compartment 5 so as to
produce another compartment 6 below the
compartment 4, said compartment being de-
fined by a transverse upstanding partition 7,
and a horizontal partition 8, the latter being
provided with an opening 9. The opening
9 is covered by a glass plate 10 carried by the
bottom of the compartment 4 which is also
provided with an opening 11. The glass
plate 10 is ruby colored or otherwise so as to
exclude actinic rays of light from the com-
partment 4. Daylight may be admitted to
the compartment 6 by opening a hinged
door 12 which is normally held closed by
some appropriate form of latch 13. By this
arrangement, light may be admitted up-
wardly through the glass plate 10 so as to
observe the developing of the plate in the
developing compartment 4 through a suit-
ably prepared sight opening in the top of the
case as will be hereinafter described. It is
also proposed to mount an electric lamp 14
within the compartment 6, said lamp being
electrically connected to a suitable source of
electricity, such for instance, as storage bat-
teries 15 contained within a box 16 carried
by one side of the case. A suitable switch 17
is carried upon the outer side of the battery
box for controlling the lamp. A reflector
18 is employed beneath the lamp to reflect
the light rays upwardly.

Working within the developing compartment 4 is a plate carrier 19 in the nature of an open rectangular frame provided at what will be termed its outer edge with a pair of upstanding fingers or projections 20, and at its opposite ends with similar projections or fingers 21, its inner edge being free from such projections or obstructions. This carrier normally lies upon the glass covered bottom of the developing bath or compartment 4 and the negative, not shown, is designed to rest upon the carrier and thereby be exposed to the action of the bath. By having the carrier formed of an open or skeleton frame, the light from the light compartment 6 will shine through the negative and thus enable the convenient observation thereof during the developing process so as to determine when the plate has reached a satisfactory developed condition. Located above the inner edge of the plate carrier, there is a transversely disposed shaft or rock bar 22 which is journaled in opposite sides of the case, one end piercing the case and provided with a crank handle 23 working upon the exterior of the case. Crank arms 24 are carried by opposite end portions of the rock bar and are pivoted to the respective upstanding ears or projections 25 upon the opposite ends of the plate carrier slightly in rear of the longitudinal center thereof. Each arm 24 is provided with a transverse stop shoulder or projection 26 overhanging the carrier and designed to engage the same when elevated to prevent overturning of the carrier tray when being elevated.

It will here be explained that it is proposed to transfer a developed plate from the developing bath into the fixing bath, and this is accomplished by swinging the crank handle 23 so as to elevate the carrier tray into the uppermost dotted position thereof, whereupon the plate will slide edgewise rearwardly and downwardly from the tray into the fixing bath. During the first stages of the elevation of the tray, it will assume the tilted disposition shown by the lower dotted position thereof, by reason of the fact that the tray is pivoted to the arms 24 in rear of its longitudinal axis. This tilting of the tray is limited by the stops 26, and the purpose of initially tilting the tray is to drain the developing solution from the plate before it is subjected to the fixing bath, thereby reducing the loss of the developing solution and consequently preventing rapid deterioration of the fixing bath by the transfer of portions of the developing solution to the fixing solution. In other words, by holding the carrier for a few seconds in its tilted position, the plate may be drained to a comparatively dry condition before being submitted to the fixing bath.

In order that the carrier may always stop at the proper elevation for discharging the

photographic plate into the fixing bath, a stop 27 is applied to the case in the upward path of the carrier for contact thereby, said stop preferably having a longitudinal slot 28 through which passes an adjustable fastening 29 for convenience in shifting the stop to set the same for properly limiting the upward movement of the carrier.

Within the fixing compartment 5 there is a plate holder which is shown in detail in Fig. 6 of the drawings, and includes an open frame or skeleton bottom 30 from which rises a back 31 and longitudinal sides 32, the front, top and bottom, of the holder being open. The sides 32 are wider at their front ends than at their rear ends, and upon the inner face of each side there is a vertical series of ledges or flanges 33 which are spaced regularly at the front of the side member and converged rearwardly, thereby forming seats or pockets for the reception of plates from the plate carrier. All but the uppermost flange or ledge are provided at their front ends with transverse upstanding shoulders or flanges 34. A pair or more of guards or fingers 35 rise from the outer edge of each uppermost flange 33 and overhang the same so as to hold a plate thereon. It will of course be understood that the back 31 closes the rear ends of the pockets formed in the holder. Projecting from each side of the holder at its rear end is a pivot stud or journal 36 which is pivotally supported by a bracket 37, best shown in Fig. 7 of the drawings. This bracket has its lower end provided with openings 38 for the reception of suitable fastenings to rigidly secure the bracket to the adjacent side of the case, the main upper portion of the bracket being offset laterally from the lower portion thereof and provided with an arcuate downwardly inclined slot 39 intersecting the front edge of the bracket for the reception of the adjacent pivot projection 36, whereby the plate holder is mounted to swing vertically and may be lifted out of the brackets whenever desired. Disposed transversely across the compartment 5 above the rear end of the plate holder is a rock bar 40 journaled in the sides of the case with one end projecting externally thereof and carrying a crank handle 41. From the middle of this rock bar there depends a crank arm 42 which has its lower end pivotally connected to a link 43, the lower end of the latter being sprung into engagement with a hooked projection 44 carried by the back of the plate holder. The crank handle 41 is provided with a stud or projection 45 for successive engagement with a series of notches 46 in the under side of a swinging detent or latch arm 47 pivotally supported upon the exterior of the case, as at 48. A suitable knob or handle 49 is provided upon the free end of the latch 47 for convenience in manipulating the same to

free and lock the adjacent crank arm. The pockets of the plate holder and notches of the latch 47 are so related that any one of the pockets of the plate holder may be disposed in position to receive a plate from the tray of the plate carrier by engaging the corresponding notch of the latch with the projection 45 of the crank handle. After the plate has been discharged into one of the pockets of the plate holder, the crank handle 41 is turned to lower the plate holder until the projection 45 engages the next adjacent notch of the latch, whereby the plate will be lowered into the fixing bath and the next above pocket of the holder will be in position to receive a plate. The purpose of the shoulders 34 is to prevent the plates from sliding out through the front end of the holder when the latter are swung down to submerge the plates in the bath.

For convenience in lifting the plate holder out of the case, after the link 43 has been sprung out of engagement with the projection 44, there is provided a bail-shaped handle 50 which is connected to the front ends of the sides of the holder and arches over the top thereof. Besides serving as a handle, the member 50 braces the holder and prevents spreading thereof under the weight of a series of plates.

To enable the convenient introduction of a plate into the apparatus, the removable top or cover 51 of the case is provided at its front and adjacent one side with a longitudinal slot 52 of a size to receive a plate endwise therethrough. This slot is surrounded by a box like seat 53 rising and inclining transversely outward from the top of the case with its upper end open and proportioned to receive one end of an ordinary plate holder. The bottom of the guideway formed by the box 53 is provided with a substantially semi-cylindrical seat 54 in which is a rotatable roller 55 having a diametric slot 56 for communication with an open ended chute 57 inclined downwardly from and carried by the under side of the lid or cover 51. Normally, the roller is turned to close the chute 57 so as to exclude light from the interior of the case, and when it is desired to introduce a negative into the case, the roller is turned to bring its slot into alinement with the guideway 53 and the chute 57, thereby to permit a plate passing through these members and into the developing compartment, the position assumed by a plate when leaving the chute being shown by dotted lines in Fig. 5 of the drawings. One end of the roller 55 is provided with a crank handle 58, and there is a stop projection 59 carried by one end of the guideway for engagement by the crank to stop the movement of the roller with its slot alined with the guideway and the chute.

For the purpose of viewing the plate in the developing bath, the top or cover of the case

is provided with a sight opening 60 located above the compartment 4 and having a ruby glass plate 61 covering the under side of the opening so as to give a view of the interior of the compartment and at the same time exclude actinic rays of light. An upstanding flange 62 surrounds the opening 60, and a removable closure 63 fits within the flange and has a handle 64 for use in removing and replacing the closure.

In practice, the compartments 4 and 5 having been charged with the developing and fixing solutions, the plate carrier being disposed upon the bottom of the compartment 4, and the plate holder in the compartment 5 adjusted to have its lowermost pocket disposed to receive a plate from the plate carrier, a plate holder is thrust into the guideway 53, said holder being of a construction to discharge its plates downwardly through the bottom thereof, such for instance, as shown in my co-pending application for patent filed on Jan. 31, 1906, Serial No. 298,863. The rotary gate or closure 55 is then turned to bring its slot 56 into alinement with the chute and the guideway, whereupon a plate is discharged from the plate holder and permitted to slide down through the chute 57 and to drop into the developing bath and upon the plate carrier. The gate 55 is then closed and the plate holder is removed from the guideway or left therein as may be desired. The seat or opening 60 in the top of the case is then uncovered so as to permit inspection of the plate during the developing process, light being admitted beneath the plate by opening the door 12 or by turning on the lamp 14. When the plate has become properly developed, the crank handle 23 is manipulated to elevate the carrier to the first dotted position shown in Fig. 2 of the drawings, so as to drain the developing solution from the plate, after which the crank handle is again manipulated to elevate the plate carrier to its limit and thereby permit of the developed plate sliding from the plate carrier into the lowermost pocket of the plate holder within the compartment 5. The plate carrier is then returned to its original position, and the plate holder is lowered one notch of the latch 47 so as to dip the plate into the fixing bath and to bring the next above pocket of the plate holder into position to receive another plate, the operations of developing and fixing the plates being successively continued until all or as many of the pockets of the holder as may be desired have received plates, whereupon the cover of the case is removed, the link 43 is sprung out of engagement with the holder, and then the latter is lifted out of the case by means of its handle 50.

From the foregoing description, it will be understood that the developing and fixing operations are successively performed within

the case without interruption and without having recourse to a dark room, and there is no danger of spoiling the plates when being transferred from the developing bath to the fixing bath. Furthermore, when in the developing bath, the plates are in full view and the developing process may be observed so as to determine the proper time for subjecting the developed plates to the fixing bath, wherefore the most effective development and fixing of the plates is assured.

Having thus described the invention, what is claimed is:

1. In a photographic developing apparatus, the combination of a case, developing and fixing baths housed therein, of a removable plate holder within the fixing bath, a plate carrier within the developing bath, and means to move the carrier to transfer a plate from the developing bath into the holder in the fixing bath.

2. A photographic developing apparatus having a bath, a plate holder mounted in the bath and provided with a series of superposed plate receiving pockets, and means to lower and elevate the holder in the bath to successively submerge the pockets.

3. A photographic developing apparatus having a bath, a swinging plate holder mounted in the bath and provided with a series of superposed plate receiving pockets open at one end of the holder and closed at the opposite end thereof, and means to lower and raise the holder to successively submerge the pockets.

4. A photographic developing apparatus having a bath, a removable vertically swinging plate holder mounted in the bath and provided with a series of superposed plate receiving pockets, and means detachably connected to the holder for lowering and raising the same within the bath to successively submerge the pockets.

5. A photographic developing apparatus having a bath, a swinging plate holder mounted in the bath and including an open bottom, an upstanding rear end, upstanding longitudinal sides, the front of the holder being open, a series of longitudinal ledges upon the inner faces of the sides forming plate-receiving pockets which are open at their front ends and closed by the back of the holder, and means to lower and raise the holder to successively submerge the pockets thereof.

6. A photographic developing apparatus having a bath, a plate holder mounted in the bath and having a series of superposed plate receiving pockets, and means to lower the holder with a step by step movement to successively submerge the pockets.

7. A photographic developing apparatus having a bath, a plate holder working in the bath and provided with a series of superposed plate receiving pockets, a rock bar, means extending between the rock bar and

the holder to lower the latter, a crank handle for the rock bar, and means associated with the crank handle to successively lock the holder in different adjusted positions.

8. In a photographic developing apparatus, the combination of a case having a bath, a plate holder working in the bath and provided with a series of superposed plate receiving pockets, means for raising and lowering the holder including a crank handle mounted upon the exterior of the case, a projection carried by the crank handle, and a swinging latch mounted upon the case and provided with a series of notches for successive engagement with the projection to lock the crank handle and the plate holder in different successive positions.

9. In a photographic developing apparatus, the combination of a case, developing and fixing baths housed therein, a plate carrier working in the developing bath, means to move the carrier to transfer a plate to the fixing bath, a plate holder working in the fixing bath, and means to set the holder to receive a plate from the carrier.

10. In a photographic developing apparatus, the combination of a case, developing and fixing baths therein, a plate carrier working in the developing bath, means to move the carrier to transfer a plate to the fixing bath, a plate holder mounted in the fixing bath and having a series of plate receiving pockets, and means to set the holder to receive plates in the successive pockets from the plate carrier.

11. In a photographic developing apparatus, the combination of a case, developing and fixing baths therein, a plate carrier working in the developing bath, means to move the carrier for transferring a plate to the fixing bath, a swinging plate holder mounted in the fixing bath and provided with a series of plate receiving pockets having their open ends directed toward the developing bath, and means to set the holder to bring the open ends of the pockets successively into position to receive plates from the plate carrier.

12. In a photographic developing apparatus, the combination of a case, developing and fixing baths therein, a partition separating the baths and terminating short of the top of the case, a plate carrier working in the developing bath, means to elevate the plate carrier and tilt the same across the top of the partition to discharge a plate into the fixing bath, a tiltable plate holder mounted in the fixing bath and provided with a series of superposed plate receiving pockets having their open ends directed toward the partition, means to set the plate holder to bring the open ends of its pockets successively into position to receive plates from the plate carrier, a removable cover for the case provided with an entrance slot in communication with the devel-

oping bath, a guideway carried by the cover and leading downwardly to the slot therein, and a closure for the slot working in the body of the guideway.

5 13. A photographic developing apparatus comprising a case, developing and fixing baths therein, a series of plate holders within the fixing bath, a guideway fixedly mounted upon the case for directing plates into the
10 developing bath, and means for conveying said plates into the respective plate holders.

14. A photographic developing apparatus comprising a case, a bath therein, a chute extending into and fixed in relation to the

case, a movable plate holder mounted within 15 the bath and having a plurality of compartments, and a plate carrier mounted to swing in the case for conveying a plate, which has been inserted through the fixed chute, into any one of the compartments. 20

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ARTHUR CLARENCE HAYDEN.

Witnesses:

WALLACE EVERETT HAYDEN,
WILLIAM CASH HAYDEN.