2 Sheets—Sheet 1.

W. A. BRICE.

PORTABLE PHOTOGRAPHIC APPARATUS.

No. 181,629. Patented Aug. 29, 1876.

Fig: 1.

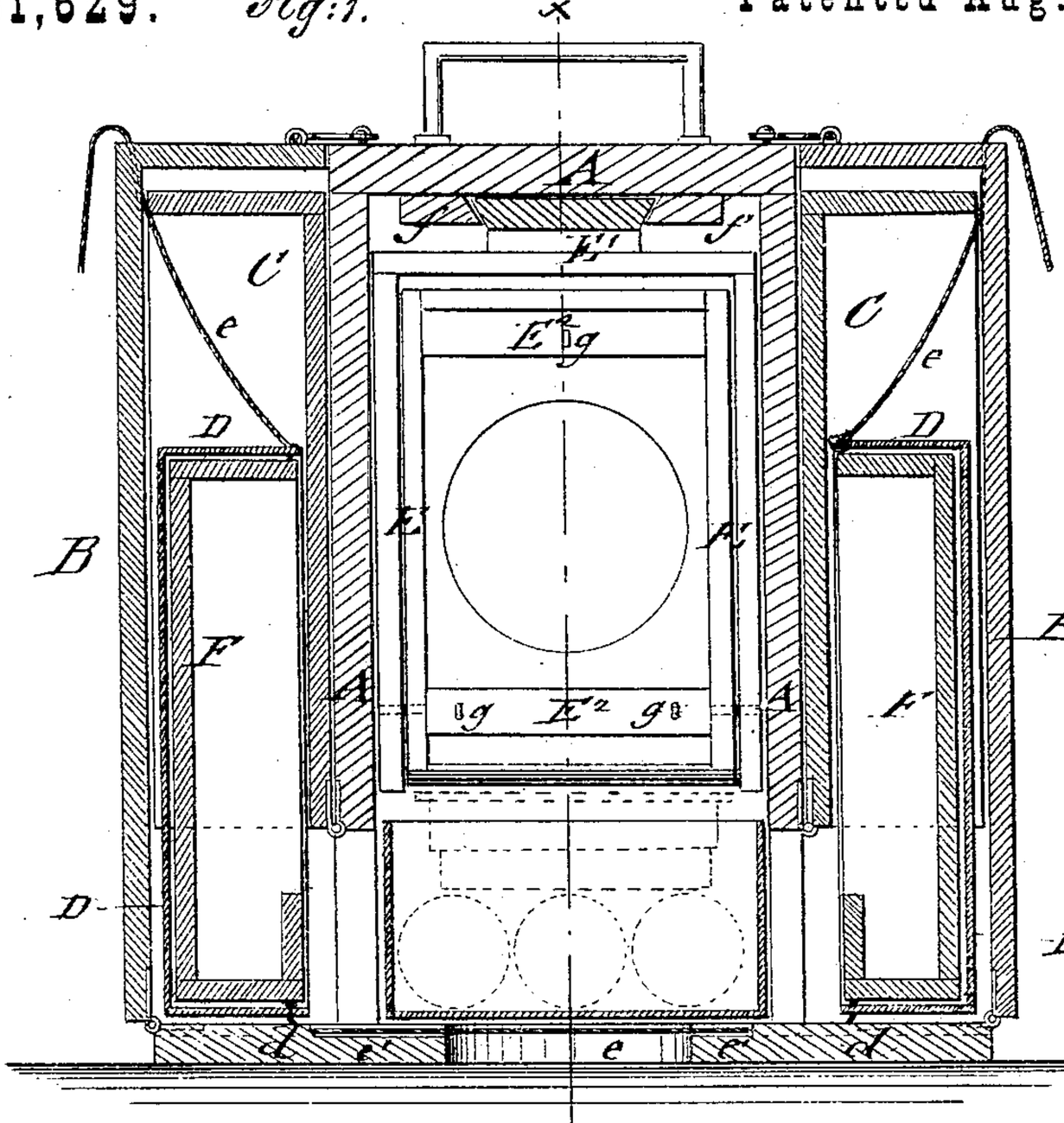
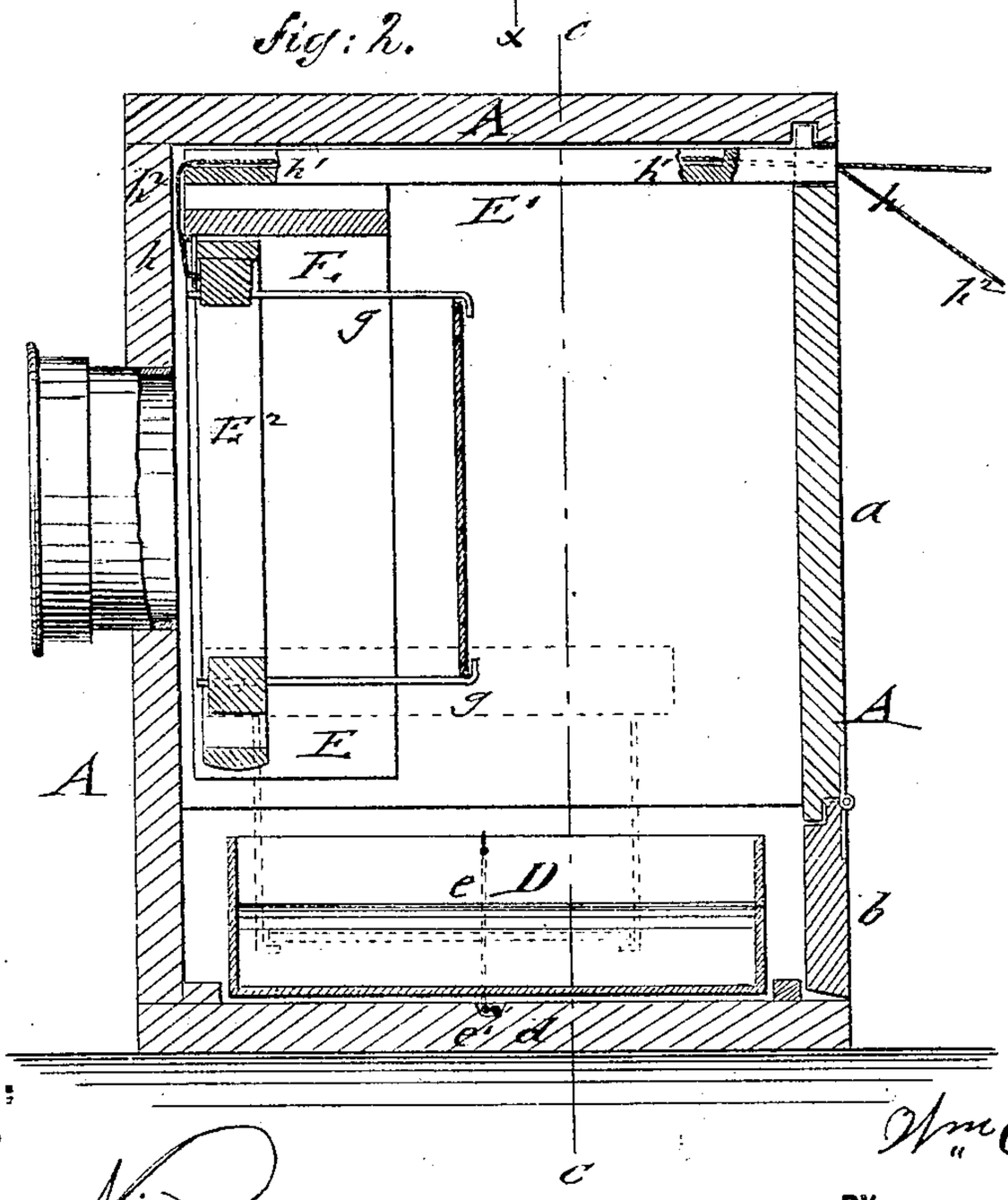


Fig: 2.



WITNESSES:

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John Goethals

INVENTOR:

Wm. A. Brice

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2 Sheets—Sheet 2.

W. A. BRICE.

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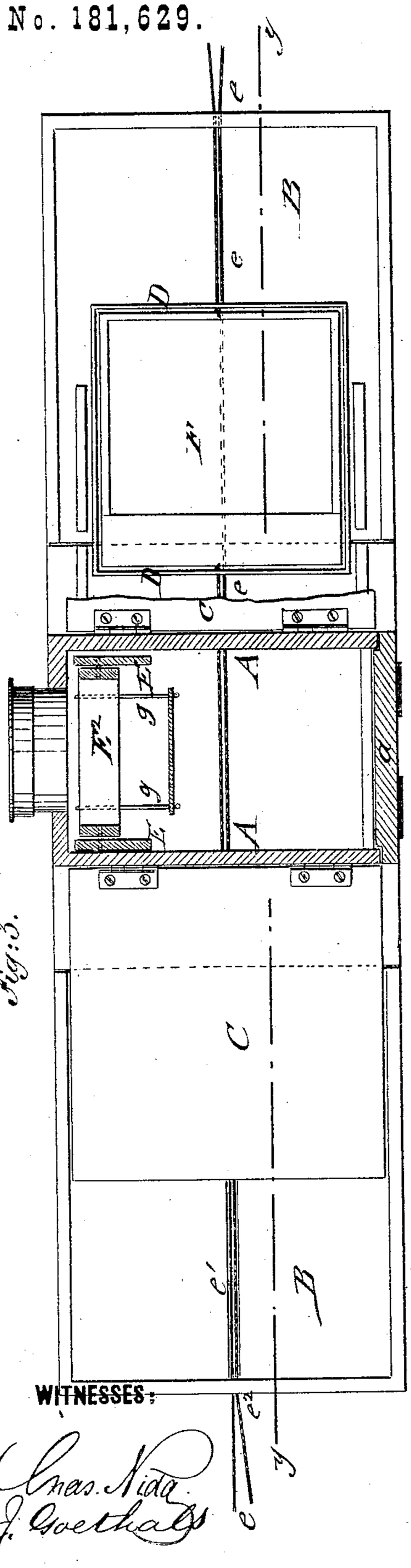

Fig: 3.

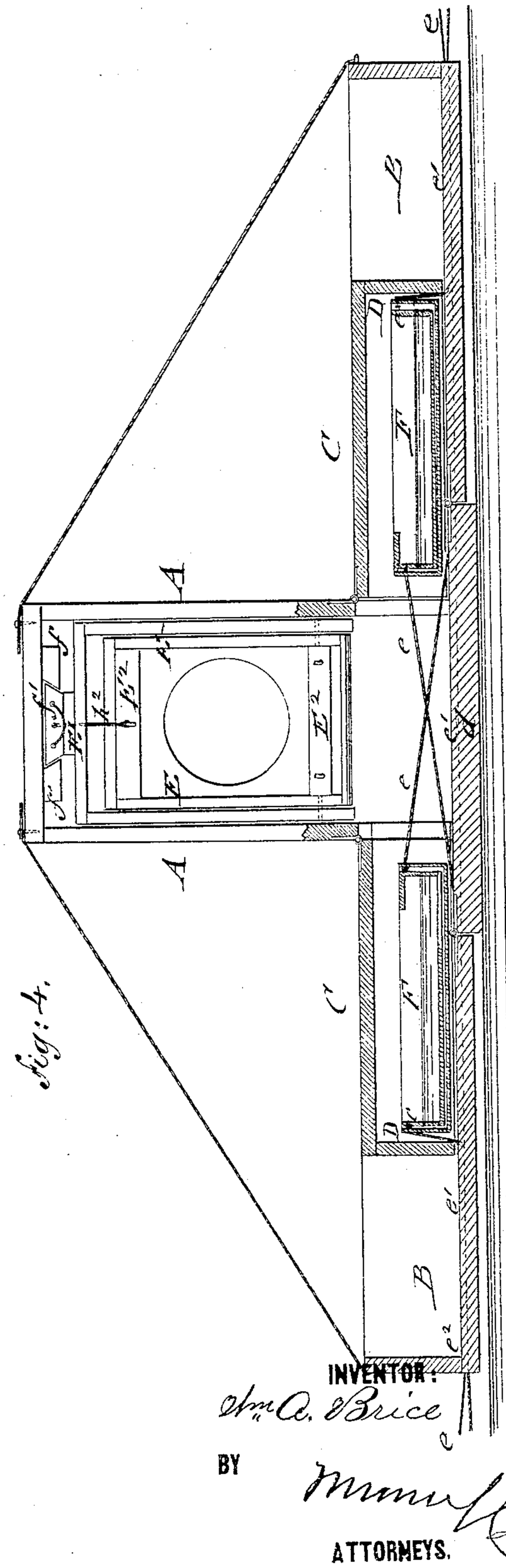

Fig: 4.

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UNITED STATES PATENT OFFICE.

WILLIAM A. BRICE, OF LONDON, ENGLAND.

IMPROVEMENT IN PORTABLE PHOTOGRAPHIC APPARATUS.

Specification forming part of Letters Patent No. **181,629**, dated August 29, 1876; application filed February 21, 1876.

To all whom it may concern:

Be it known that I, WILLIAM A. BRICE, of London, England, have invented a new and Improved Photographic Apparatus, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a vertical longitudinal section of my improved photographic apparatus on the line *c c*, Fig. 2, shown folded up for being carried from place to place. Fig. 2 is a vertical transverse section on the line *x x*, Fig. 1; Fig. 3, a plan view, partly in horizontal section, showing apparatus in open position ready for work; and Fig. 4 is a vertical longitudinal section of the opened apparatus on the line *y y*, Fig. 3.

Similar letters of reference indicate corresponding parts.

The object of my invention is to furnish a neat and compact apparatus for photographic purposes, that is intended to enable persons having no knowledge of photography to succeed at once in reproducing any object, whether for amusement or for more serious technical and scientific purposes.

The operations of the apparatus are of an entirely mechanical nature, requiring no dexterity and skill, and dispense with any dirtying of hands and staining of clothes by chemicals. The expensive, cumbersome, and unpleasant dark room or tent is dispensed with, which adapts the apparatus advantageously for outdoor purposes, especially as the compact shape and easy opening and closing of the apparatus admit of its being easily carried from place to place, and then readily manipulated for use.

The invention consists of a central casing with lens and sliding focusing-frame, to the larger base part of which are hinged side casings, that may be thrown down and suspended in horizontal position in suitable manner. The central casing is recessed at the lower part, and shorter boxes or covers hinged thereto to be swung down on the outer side parts. Trays, partly covered, forming pockets for the sensitizing and developing solutions, are moved by means of strings from the side cases into the central casing, to plunge the glass plate, supported on holders of a frame pivoted to the sliding focusing-frame, first in the silver-bath and after exposure to light into the developing-bath. The water-bath is finally introduced through the lower hinged part of the rear part to fix the picture, after which it is removed for printing.

In the drawing, A represents the central casing of my photographic apparatus, which is provided at the front side, in the customary manner, with a lens and detachable cap, and at the rear side with a removable shutter, *a*, that is provided at the lower part with a hinged lid, *b*, for inserting the water-tray. The bottom *d* of casing A extends at both sides of the same, and has the side cases B hinged to its edges. The bottom forms the base of the instrument when placed on a table, or other support, and has a central hole to allow of being placed over a microscope when such photography is desired. The side cases fold up against the main or central casing, and are securely attached to the same by hook-and-eye or other fastening devices at the top, the different operating parts being then inclosed safely within the interior of the cases, and the whole readily carried by a hinged top handle, being thus brought within very convenient and compact shape. The side cases B may be let down into horizontal position to a level with the bottom of the middle casing A, they being retained in this position by strings, chains, or other suspension devices, as shown in Fig. 4, or sustaining-bars.

The sides of the central casing A are open at the lower part to some distance from the bottom, so that the trays, with the sensitizing and developing solutions may pass readily through these openings from the side casings into the central casing.

To the lower edge of the side walls of the central casing are hinged boxes C, of such a size as to inclose entirely the sliding trays D when the boxes are brought down to rest on the side casings B, as shown in Fig. 4. In this position they form, with the central casing, the dark room for taking and fixing the picture on the sensitized glass plate. When the apparatus is folded up, the boxes are thrown up, so that they rest against the side walls of the casing A, as indicated in Fig. 1.

The trays D are preferably made of sheet-zinc, and controlled from both sides of the ap-

paratus by differently-marked strings *e*, so that they may be moved from the side casing into the central casing, and back again, as required.

Inside of the sliding trays D are placed water-proof card board trays F, for the baths, which are partly covered at the ends, to form a sort of pocket, so as to allow of their being tipped up and holding the few drops of liquid that may remain after emptying the baths.

The strings *e* run in longitudinal or diagonal grooves e^1 of side and central casings, and pass through perforations e^2, to the outside, being prevented by knots or buttons from slipping through to the inside. The strings *e* are attached to both sides of the trays, one string being attached to one side, and passing out at the end of the side casing, and the other string being attached to the other side of the tray, and passed along the bottom of the central and side casings to the outside, through the hole at the end wall of the opposite side casings.

The focusing-frame E slides, by means of an endless screw, operated by a winch or by a dovetailed piece, E, in guide-strips *f* at the inside of the top part of the casing A, slide-piece E being graduated at the top or side to admit the exact reading off of the distance it is drawn out, and allow the resetting of the same into the same position for taking the picture. A loop, ring, or other device, *f'*, serves to move the focusing-frame in the required position.

Inside of the focusing-frame, at the lower part of the same, is pivoted a swinging frame, E^2, which supports, on projecting wire arms *g* with bent or hook ends, the ground-glass or sensitized plate. The pivoted frame E^2 is secured, by a suitable catch device, to the outer frame E, and the catch released by a string, *h*, passing in a groove, h^1, of the slide piece E^1 to the rear part of the apparatus. A second longer string, h^2, runs to the outside in the same groove, and slowly lowers and raises the pivoted frame with the sensitized glass into or out of the different solutions in the trays. The upward motion of the pivoted frame is continued until the catch locks it again to the outer main frame E.

Besides the trays in the side boxes, an additional water-tray is required, that is introduced, through the lower hinged rear part *b*, to the interior of the central part, to finally wash the glass plate. Suitable boxes, for the storage of the glass plates, and different bottles with the chemicals, complete the apparatus, all the parts of which are placed into the interior of the central and side cases, as shown in Fig. 1.

The apparatus is operated as follows: The side cases are first opened and lowered into horizontal position, being retained by the suspension strings or bars. The central casing is then opened at the rear part, and the water-tray, with the solution-bottles stored therein, removed. The side boxes are also swung down until they rest on the opened side cases and cover the side trays. The lens is then screwed into the front part of the box, and the cap of the same taken off. The focusing-frame is then drawn out by the slide-piece or screw, and the ground glass, with the unpolished side next to the lens, placed on the silver hooks, care being taken that the inner pivoted frame is securely held by the catch. The focusing-frame is then pushed home until the image of the person or object to be photographed is clearly and distinctly perceived on the ground glass, after which the number on the scale of the slide piece, that indicates the distance which it extends to the outside of the box, is read off, to enable the operator to replace it afterward into the same position when ready to take the picture.

One of the side trays and baths is then drawn into the central casing, and filled with the silver solution from one of the bottles, which are specially constructed for this purpose. The filled tray is then drawn to the side again, and the tray at the other side moved forward by the second string, and filled in similar manner with the developing-solution. The developing-tray is then drawn back into its cover or box, and the focusing-frame then moved back for placing the glass plate, which has been first collodionized on the arms of the same, into the exact position which the ground glass or focusing-plate occupied before. The focusing-frame is then moved back into the casing, and the center compartment closed by applying the detachable rear shutter or wall. The lens is then covered, the catch of the inner pivoted frame released, and the plate gradually lowered by the longer string into the tray with the silver solution, which has been pulled by the proper string into the central compartment. The collodionized plate is allowed to remain in the silver-bath for about four minutes, being then sensitive to light. The pivoted frame is then pulled up again until the click of the catch gives notice that it is locked into position in the focusing-frame, which is then moved by the top slide piece or winch into the exact position occupied before, by setting the slide-piece to the figure read off.

The object or person to be photographed is then brought into position, and the cap taken off to expose the sensitized plate to the action of the light in the customary manner. The cap is then promptly but gently replaced, and the focusing-frame pushed home. The iron or developing solution is then carried forward by means of its string, and the plate plunged into the solution in the manner before described, to remain therein for about ninety seconds, and bring out the picture gradually on the plate. The glass plate is raised again, the tray carried sidewise, and the lower door at the rear shutter opened to introduce the water-tray into the central compartment.

The plate is then let gently into the water-bath for fixing the picture and washing the

plate. The glass plate is finally taken out, and treated in the customary manner for producing the finished picture.

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

1. A photographic apparatus, composed of a central casing or compartment, with sliding and pivoted focusing-frame, hinged side cases, hinged interior covering-boxes, and adjustable trays for the different solutions, the whole being arranged to fold and close into portable shape, substantially in the manner and for the purpose set forth.

2. The movable solution-trays, being provided at both sides with strings that run in grooves, and perforations of the bottom and of the side casings, to move the same into the central compartment and back again, substantially as set forth.

3. The hinged covers or boxes fitting on the opened side cases to inclose the trays, and produce the dark room with the central compartment, as described.

4. The combination of the focusing-frame, sliding by means of a top piece or guides of the central casing, with the inner pivoted frame, having catch devices and strings for lowering, raising, and locking the frame, substantially as specified.

5. The inner pivoted frame, having projecting arms at top and bottom for supporting the ground-glass or sensitizing plate, substantially as described.

WILLIAM ALEXANDER BRICE.

Witnesses:
CHAS. H. UPTON,
A. NELSON LEWIS.