G. H. WHITE.

PHOTOGRAPHIC PLATE HOLDER FOR USE WITH X-RAYS.

APPLICATION FILED JUNE 21, 1913.

1,166,797.

Patented Jan. 4, 1916.

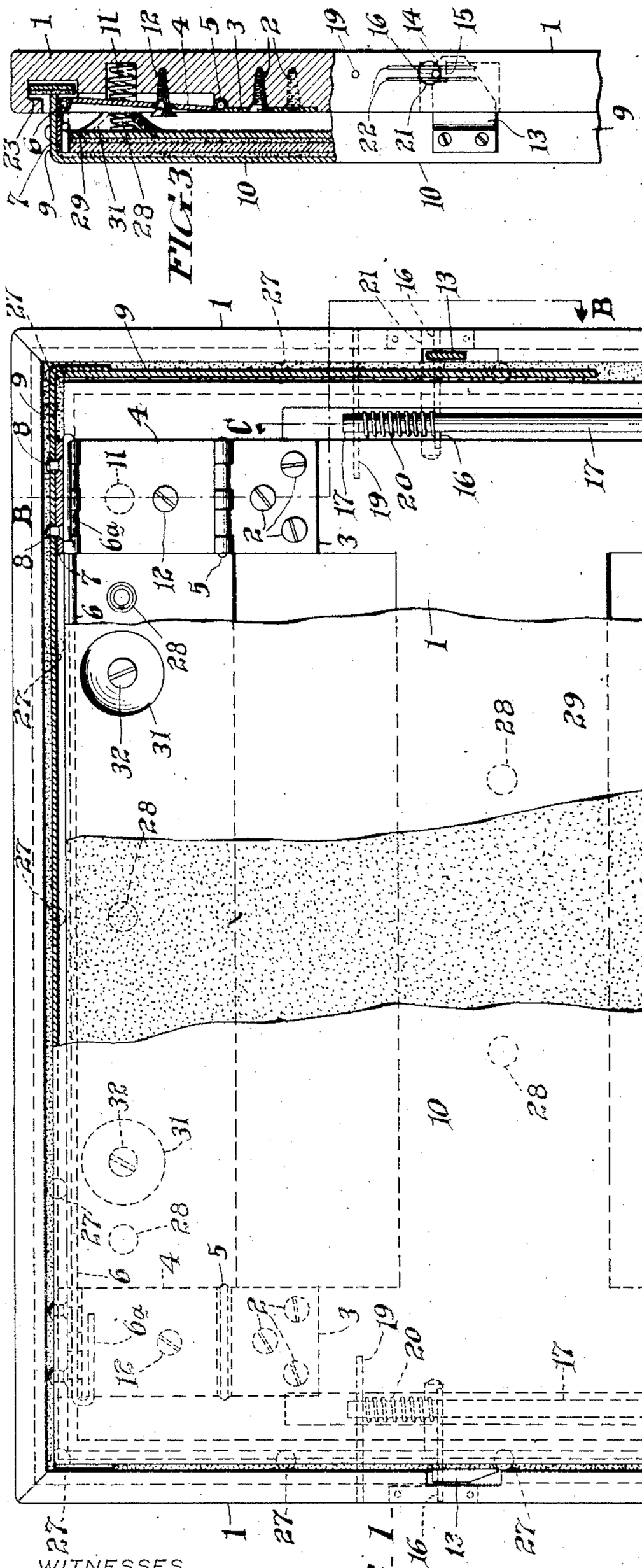

FIG. 3.

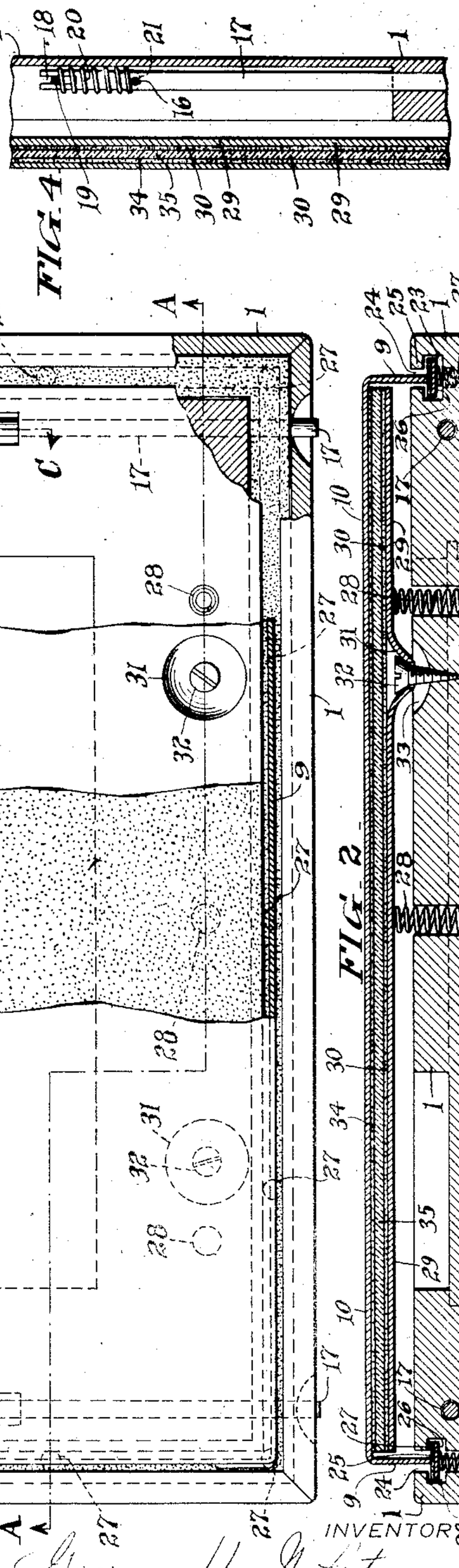

FIG. 4.

FIG. 1.

FIG. 2.

WITNESSES

Daniel W. Oates, Jr.

William Conway.

INVENTOR

George H. White

BY

Cornelius L. Ely

ATTORNEY

UNITED STATES PATENT OFFICE.

GEORGE H. WHITE, OF HAVERFORD, PENNSYLVANIA.

PHOTOGRAPHIC-PLATE HOLDER FOR USE WITH X-RAYS.

1,166,797. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed June 21, 1913. Serial No. 774,949.

To all whom it may concern:

Be it known that I, GEORGE H. WHITE, a citizen of the United States, residing at Haverford, county of Delaware, State of Pennsylvania, have invented certain new and useful Improvements in Photographic-Plate Holders for Use with X-Rays, of which the following is a specification.

My invention relates to photographic plate holders, and more particularly to holders or cassettes for sensitized plates, or sensitized plates and intensifying screens, the holders of cassettes being opaque to ordinary daylight but translucent or transparent, on one or more sides, to X-rays or the like.

It is the object of my invention to produce such a holder or cassette of simple construction and which in use shall require a minimum number of operations or motions on the part of the user.

It is a further object of my invention to provide such a structure which shall insure good contact between the photographic plate and the intensifying screen, if the latter be used.

It is a further object of my invention to provide a construction in which photographic plates smaller than the maximum accommodated by the holder may be used without recourse to supplemental apparatus, such as kits.

To these ends I have provided a holder or cassette comprising a base or frame to which is attached a cover, the base or frame carrying a pressure plate, between which and the cover is held the photographic plate, or the photographic plate and intensifying screen.

My invention resides in the features of construction hereinafter described and claimed.

For an illustration of one of the forms my invention may take reference is to be had to the accompanying drawing, in which:

Figure 1 is a top plan view of the holder, some parts broken away and some parts shown in horizontal section. Fig. 2 is a vertical sectional view taken on the line A—A of Fig. 1. Fig. 3 is a fragmentary vertical sectional view, some parts in elevation, taken on the line B—B of Fig. 1. Fig. 4 is a fragmentary vertical sectional view taken on the line C—C of Fig. 1.

Referring to the drawing, 1 is a base or frame member which may be made of wood or any other suitable material. To the upper side of the base 1 are secured by screws 2 a hinge or hinges, each comprising the member 3 held by said screws 2, an intermediate hinge member 4 pivoted to the member 3 at 5, the member 4 being in turn hinged at 6 to the plate 7 secured by rivets 8 or any other suitable means to the downwardly extending margin or flange 9 of the cover 10. Associated with one of the members 4 is a spring 11, disposed in a countersink in the base 1, the spring 11 thrusting up against the under side of the member 4. A screw or other suitable means 12 extends freely through a hole in the member 4 into the base 1, the head of the screw serving to limit pivotal movement of the member 4 at 5 in an upward or counter-clockwise direction as viewed in Fig. 3.

To the two side margins or flanges 9, as viewed in Fig. 1, are secured catches 13 each having an inclined edge 14 and a notch 15, as shown in Fig. 3, adapted to receive the pin 16 carried by and extending transversely to the push rod 17 which is movable longitudinally in the base 1, one end extending out at the front of the base, as shown in Fig. 1. At its inner end the rod 17 is forked or slotted as indicated at 18, Fig. 4, the pin 19 extending transversely to the rod 17 and held in the base 1 and extending through the slot 18. A spring 20 surrounds the rod 17 and is confined between the pins 16 and 19 and tends to thrust the rods 17 outwardly toward the front of the base. The pin 16 extends through the circular or other hole 21 in the base 1 and is disposed between the two plates 22 extending across the opening 21, the plates 22 being preferably of metal and set into the base 1.

Extending around the four margins of the base or frame 1 is the slot 23 communicating with the upper surface of the base 1 through the narrower slot 24 through which the flanges 9 are adapted to extend and engage with their lower edges upon the felt or similar material 25 supported upon the preferably resilient strips 26, such as spring brass, beneath which in counter-sinks in the base 1 are disposed the springs 27 normally thrusting the strips 26 and felt 25 upwardly, but yielding when the cover 10 is closed.

In counter-sinks in the base 1 are provided also a plurality of springs 28 thrusting against the lower side of the pressure plate 29 covered with a layer of felt or other suitable material 30. At a plurality of

points the plate 29 is counter-sunk as indicated at 31, and through these counter-sinks extend screws 32, or the like, into the base 1, the screw heads being disposed beneath the felt 30. These screws hold the plate 29 in place to allow vertical movement thereof and limit such vertical movement. The base 1 has counter-sinks 33 beneath the counter-sinks 31 to allow ample movement of the plate 29.

The inside of the cover 10 is preferably lined with a sheet 34 of felt, paper or the like. And between such sheet and the felt 30 upon plate 29 is placed the photographic plate 35, either above or below which, if desired, may be placed an X-ray intensifying screen.

The operation is as follows: Assuming the holder or cassette loaded with a sensitized plate and locked closed, as indicated in the drawing, the holder may be placed in proper relation with respect to the X-ray tube and the patient. Generally the aluminum cover 10, translucent or transparent to X-rays, is placed next to the patient and toward the X-ray tube. The exposure is then made by exciting the X-ray tube in the usual way. To remove the photographic plate from the holder, the holder is carried to the dark room, unless the sensitized plate 35 is itself inclosed in a light proof envelop. The operator then presses inwardly upon the outer ends of rods 17, thus carrying the pins 16 out of the notches 15 of the catches 13, freeing the cover 10 which may be raised manually, or which is raised by the torsion spring 6 which is a piece of resilient wire extending through and forming the pivots for the two hinge members 4, and being hooked back at 6^a. One of these hook ends, the right hand one, Fig. 1 presses against the rear flange 9 of the cover 10 while the left hand one rests against the hinge member 4. When the cover is unlatched by pressing the rods 17, 17 in opposition to their springs 20, the cover first rises vertically, the hinge members 4 swinging slightly upon their pivots 5 until limited by screws 12. The spring 11 and the torsion spring 6 at its end at opposite plate 4 produce this vertical movement. And during such vertical movement the springs 27 raise the members 26 and attached felt 25 upwardly against the base 1, and springs 28 raise plate 29. After this initial vertical movement of the cover it swings to open vertical position. The plate 35 is then removed. In reloading, a plate 35 is placed upon the felt 30 upon the pressure plate 29 and the cover closed by swinging upon its hinges in opposition to spring 6 until it is substantially horizontal or parallel with the base 1. Then vertical pressure downward upon the cover 10 causes the catches 13 to move downwardly, the edges 14 engaging upon the upper sides of the pins 16 and forcing them and their attached rods 17 inwardly in opposition to springs 20 until the pins 16 come opposite the notches 15 whereupon the springs 20 restore the rods 17 outwardly and move the pins 16 into these notches 15, thus holding the cover closed. And in this vertically downward movement of the cover the lower edges of the flanges 9 engage the felt light proofing strips 25 upon yielding strips 26, pressing these strips downwardly in opposition to springs 27 which accordingly hold the light proofing material snugly against the lower edges of flanges 9. Pressure plate 29 yields downwardly in opposition to springs 28 to firmly hold the plate 35 in position between felt 30 and cover lining 34. The initial vertical movement of the cover with respect to the base prevents rubbing and scratching of the photographic plate, and of the intensifying screen if used. The holder may also be loaded by turning it upside down and placing the plate in the cover 10 and then swinging and depressing the base 1 to locking position.

The cover 10 and plate 29 are preferably made of aluminum to secure light weight of the apparatus; and as to cover 10 it is preferably made of aluminum so as to be translucent or transparent to X-rays.

If it is desired that the holder shall be opaque to X-rays from the bottom, either the base 1 or the plate 29 may be made of suitable material opaque to X-rays.

By means of the pressure plate construction described, in addition to the functions hereinbefore stated in connection with the same, photographic plates smaller than the maximum capacity of the holder may be used, the same being held in place by the pressure plate 29 wherever placed upon such pressure plate when loading the holder. By this means the use of kits or other supplemental devices is avoided.

What I claim is:

1. In an X-ray plate holder, the combination with a base, of a cover, a pressure plate resiliently mounted on said base, a member pivoted to said base between said base and said pressure plate, and a pivotal connection between said cover and said member.

2. A holder for exposing a sensitized member to X-rays comprising the combination with a base, of a cover, said cover and base excluding ordinary light from a sensitized member held between them, a plurality of hinges connecting an edge of said cover and base, each of said hinges comprising members secured respectively to said base and cover and an intermediate member pivoted to said members, a torsion spring whose one end bears against said cover and whose other end bears against the intermediate member of one of said hinges, and a

spring intervening between the intermediate member of another of said hinges and said base.

3. In an X-ray plate holder, the combination with a base, of a light proof cover having an inturned marginal flange, and light proofing material resiliently mounted upon said base adapted to be engaged by said flange.

4. In an X-ray plate holder, the combination with a base, of a cover having an inturned flange, said base having a slot communicating with a narrower slot, and resiliently mounted light proofing material disposed in said slot, said flanges adapted to extend through said narrower slot into engagement with said material.

5. In an X-ray plate holder, the combination with a base, of a cover having an inturned flange, and light proofing material resiliently mounted in a slot in said base and engaged by said flange.

6. A holder for exposing a sensitized member to X-rays comprising the combination with a base, of a cover opaque to ordinary light and transparent to X-rays and whose external surface is substantially smooth or unobstructed, whereby the object to be subjected to X-rays may closely contact said external surface, a pressure plate yieldingly mounted on said base for movement substantially parallel with said base, and marginal flanges on said cover surrounding said pressure plate.

7. A holder for exposing a sensitized member to X-rays comprising the combination with a base, of a cover, a pressure plate yieldingly mounted upon said base, said cover and said pressure plate adapted to exclude ordinary light from a sensitized member held between them, flanges on the edges of said cover, and light proof material resiliently mounted on said base and adapted to be engaged by said flanges.

8. In an X-ray plate holder, the combination with a base, of a cover opaque to ordinary light and transparent to X-rays, said cover having an unobstructed external surface, whereby the object subjected to X-rays may closely contact with said cover at any portion of said external surface, marginal flanges on said cover engaging in said base, and means between said cover and base and surrounded by said flanges for thrusting a sensitized member against the inside of said cover.

9. In an X-ray plate holder, the combination with a base, of a cover transparent to X-rays having an inturned flange, light proofing material resiliently mounted on said base and engaged by said flange, and a pressure plate yieldingly mounted on said base for thrusting a sensitized member against the inside of said cover.

In testimony whereof I have hereunto affixed my signature in the presence of the two subscribing witnesses.

GEORGE H. WHITE.

Witnesses:
A. S. MARSH,
N. B. EVANS.