

APPLICATION FILED AUG. 9, 1919.

4 SHEETS--SHEET 1.



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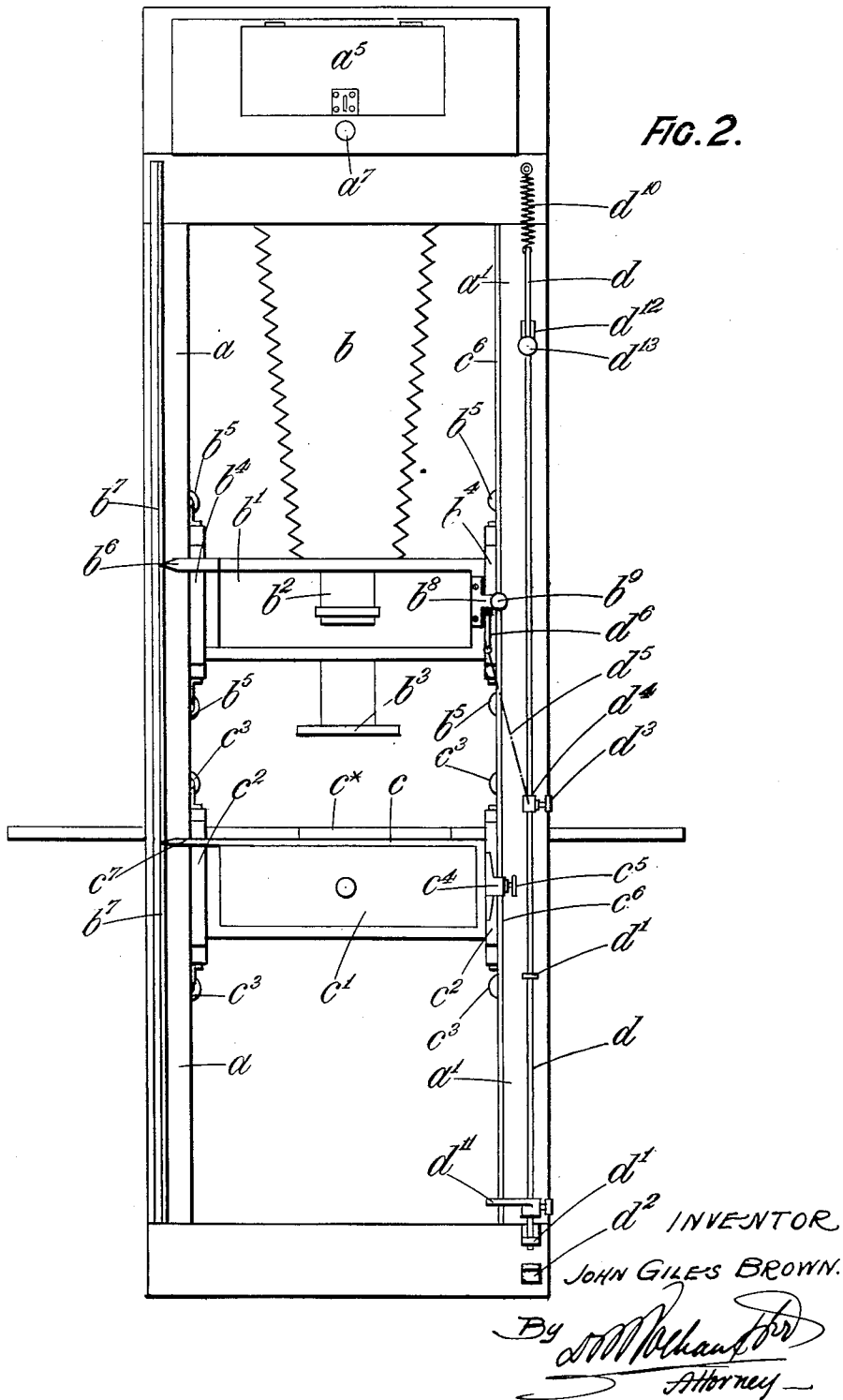
UPRIGHT PHOTOGRAPHIC, ENLARGING, COPYING, AND REDUCING APPARATUS.

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1,398,671.

Patented Nov. 29, 1921.

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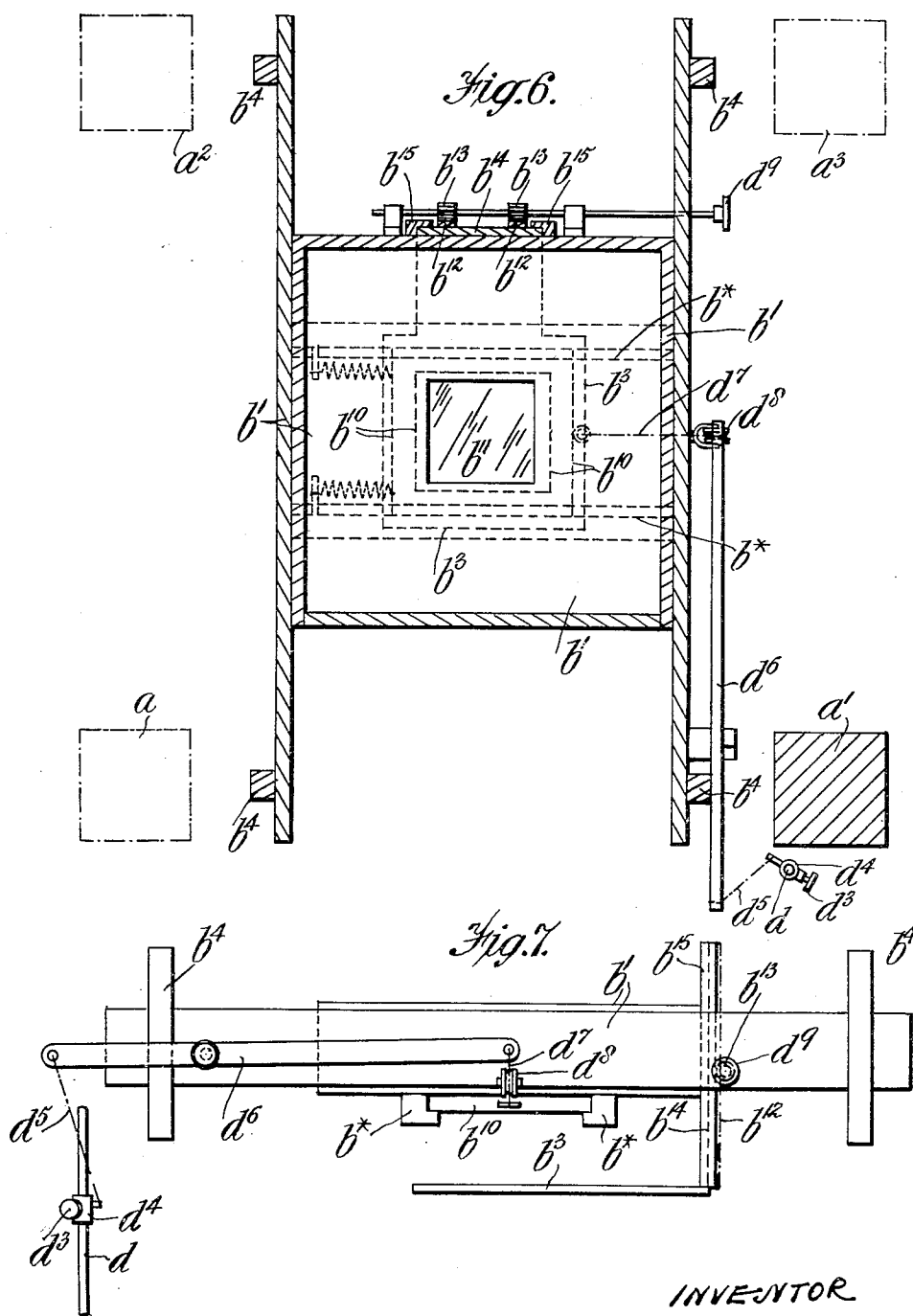
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

JOHN GILES BROWN, OF NEWPORT, ENGLAND.

UPRIGHT PHOTOGRAPHIC, ENLARGING, COPYING, AND REDUCING APPARATUS.

1,398,671.

Specification of Letters Patent.

Patented Nov. 29, 1921.

Application filed August 9, 1919. Serial No. 316,328.

To all whom it may concern:

Be it known that I, JOHN GILES BROWN, a subject of the King of Great Britain and Ireland, and a resident of Newport, county of Shropshire, England, have invented a certain new and useful Improvement in an Upright Photographic, Enlarging, Copying, and Reducing Apparatus, of which the following is a specification.

This invention relates to an apparatus for enlarging, copying, or reducing, by direct daylight, or by means of artificial light, either on single pieces, or strips of paper or card.

In order that the invention may be clearly understood, reference is to be had to the following description and accompanying sheets of drawings, wherein:—

Figure 1 is a perspective view of the apparatus.

Fig. 2 is a front view thereof.

Fig. 3 is a sectional plan view of the negative carrying chamber.

Fig. 4 is a sectional view taken on the line Y—Y of Fig. 3.

Fig. 5 is a sectional view taken on the line X—X of Fig. 3.

Fig. 6 is a sectional plan view of the lens box.

Fig. 7 is a side elevation of the lens box.

In carrying out the invention and referring first to Figs. 1 and 2, the apparatus consists of a wooden framework, six feet six inches high, or according to requirements, and constituted by four vertically disposed uprights a , a' , a^2 , a^3 rigidly connected together at top and bottom. The top part is closed in on all sides to form a negative carrying chamber, except for an opening a^4 , closed by door a^5 , giving access to the negative carrier, said door a^5 being provided with a suitable hinged and slotted device a^6 to hold the same open when required. a^7 is an adjusting screw for centering the negative carrier's back and forward movement, about $\frac{3}{4}$ inch each way, and a^8 is an adjusting screw for centering negative carrier's side to side movement, also about $\frac{3}{4}$ inch each way.

The top part, which is the negative carrying chamber of the apparatus, is located as near as possible to a skylight, or to the artificial light, if such be used, and all light is obscured except such as passes through the opening in the top of said negative carrying chamber, and in this chamber is arranged the negative carrier.

This carrier Figs. 3, 4 and 5 consists of two superimposed frames g , g' respectively, the lower g' of which is adapted to slide in the bottom a^{**} of the top part or negative carrying chamber of the apparatus, and with a side-to-side movement therein, while the upper frame g is adapted to slide in the lower frame g' but in a direction at right angles thereto, *i. e.*, with a back-to-front and vice versa movement, and said frames are actuated by the beforementioned adjusting screws. The screw a^7 engages in a stud g^2 which extends upward through a slot g^3 in the top frame g to allow of the side-to-side movement of the lower frame g' , the stud g^2 being provided with a head g^4 which takes in undercut portions g^5 at the bottom of the slot g^3 , while the screw a^8 engages in a stud g^6 on the bottom frame g' .

To the lower part of the negative carrying chamber, is affixed the upper end of the bellows b which opens out to about three feet, and at its lower end is affixed to the top of a box b' which carries inside it the lens b^2 , and in the bottom part a spring-controlled shutter, and on the underside the vignetting support b^3 . The shutter consists of a wooden frame b^{10} , Figs. 6 and 7, with orange glass panel b^{11} , and works in the bottom part of the lens box and between guides b^* , directly below the lens b^2 .

The box b' , which is adapted to be moved up and down on guides on the support of the apparatus, is provided with end strips b^4 , to give more bearing and maintain parallelism and also with rollers b^5 , or it may be balls, adapted to travel on the guides or runners on the supports, and said box b' is further provided with a pointer b^6 , which registers with the scale or rule b^7 on the support a , said scale or rule being marked off in inches, to assist or act as a guide in setting.

The base of table c , on which the holder c^* —Fig. 2—is received is also adapted to be moved up and down, and is of box formation, with drawer c' , end strips c^2 , and rollers c^3 , or it may be balls, working on the beforementioned guides or runners on the supports. Further, said case or table c is provided with a bracket c^4 , and thumb-screw c^5 to engage a rod c^6 and hold said base or table securely in position when the same is set, said rod c^6 being affixed by its upper and lower ends to the support a' of the apparatus, and said base or table c is also provided with a pointer c^7 which registers with

the beforementioned scale or rule b^7 to assist or act as a guide in setting.

The lens box b' is also provided with a bracket b^8 and thumb-screw b^9 to engage the rod d^6 and hold said lens box b' securely in position when the same is set.

d is a vertically disposed rod, slidably mounted in guides d' on the front support a' , and d^2 is a stop to limit the downward movement of said rod d . On the rod d there is slidably and adjustably mounted, by means of a thumb-screw d^3 , a collar or the like d^4 , connected by chain or the like d^5 to the outer end of a lever d^6 operatively connected with the shutter b^{10} by means of a cord d^7 , passing over a pulley d^8 , mounted on the lens box b' , and d^9 is the operating knob of the rack and pinion adjustment b^{12} , b^{13} , respectively, of the vignetting support b^3 , the racks b^{12} being mounted on the upright b^{14} of the vignetting support b^3 , while the pinions b^{13} are carried by the shaft of the operating knob d^9 , the shaft being mounted in brackets on the back of the lens box b' , and the upright b^{14} being slidably mounted in guides b^{15} , also on the back of said lens box b' .

The upper end of the rod d is connected by a spring d^{10} to the top of the apparatus, and the lower end of said rod is provided with an adjustable pedal d^{11} ; further, said rod d passes through a bracket d^{12} , carried on the front support a' , and is locked therein by means of a thumb-screw d^{13} , said bracket d^{12} and thumb-screw d^{13} serving to fix the rod d securely in position for the purpose of holding the shutter open, while focusing, or for long exposures, *i. e.* chain d^5 taut, said chain d^5 , when thumb-screw d^3 and bracket d^4 are loosened, taking up its position on the rod d when setting the lens box b' to different sizes.

e and e' are cords, connected respectively to the lens box b' and the base or table c , said cords which pass over pulleys e^2 —Fig. 1—being connected to balance weights, not shown, working in the vertical spaces a^* in the supports of the apparatus, said cords and weights being, as will be understood, arranged at all four supports.

Bromid post cards or paper copies can be obtained with as much ease, and quite as

quickly as a contact copier, either by enlargement or reduction. Exposures will vary according to light and lens used, but with a good light and a good lens, exposures of one second can be secured for average negatives.

Having now described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. A photographic enlarging, reducing and copying apparatus, including a frame having a negative receiving chamber at top thereof, a negative carrier located in said chamber, and means for imparting a back-to-front, and side-to-side movement thereto, a lens-carrying box balanced and slidably mounted in said frame, a spring-controlled shutter slidably mounted in lower part of said box, means for actuating said shutter, a vignette supporter located on the underside of said box, and means for adjusting the position of said box, a base balanced and slidably mounted in said frame and below the vignette support, a scale mounted on one side of the frame, pointers carried by the lens box and base to register with said scale to assist in adjusting the positions of the lens box and base, and means for retaining said lens box and base or table in their adjusted positions.

2. A photographic apparatus of the class described including a frame, a fixed inclosure at the top of the frame constituting a negative receiving chamber, an adjustable lens-carrying box in the frame beneath the inclosure, a shutter mounted in the lens box, and means for operating said shutter including a manually operated rod carried by the frame, a pivoted lever carried by the lens box and connected with the shutter, and a flexible connection between the manually operated means and the pivoted lever.

3. A photographic apparatus of the class described including a frame, a fixed negative receiving member at the top of the frame, a balanced adjustable lens box beneath the negative receiving member, a balanced work-carrying member beneath the lens box, and a vignetting support adjustably carried by the lens box at one side of the shutter position thereof.

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