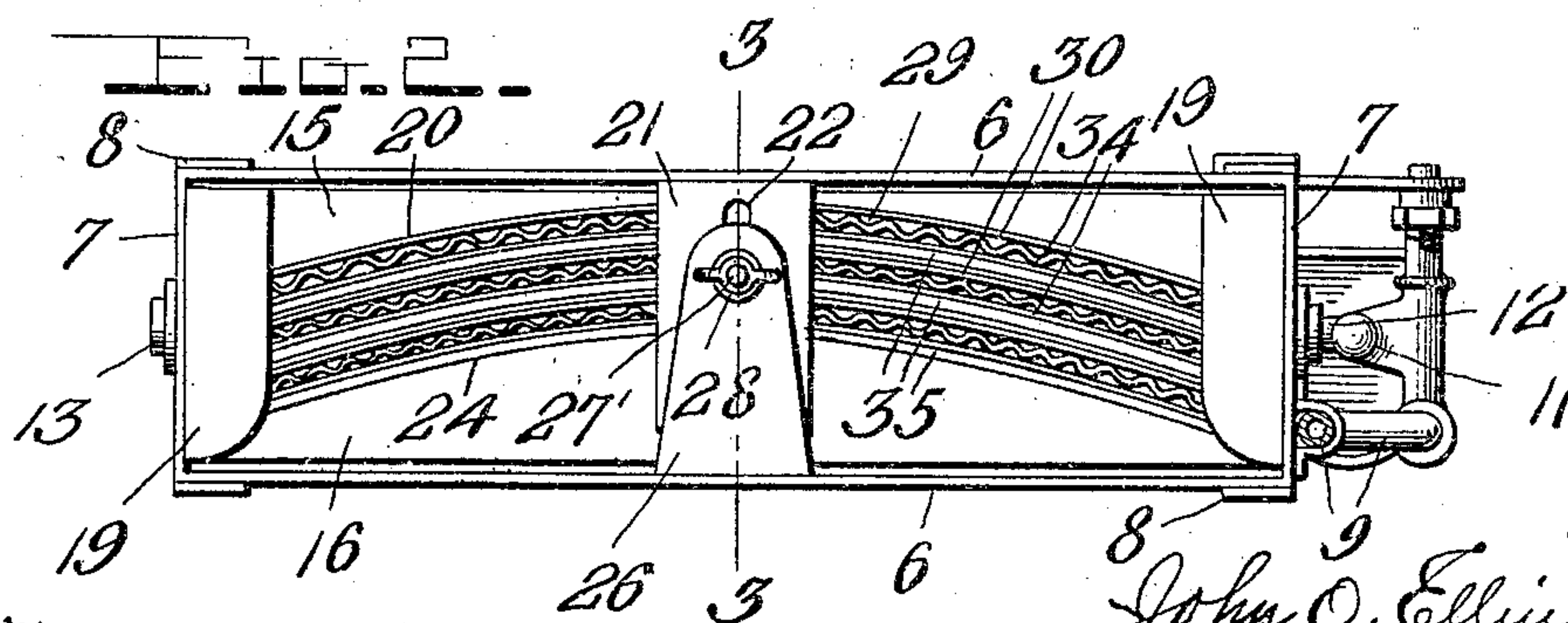
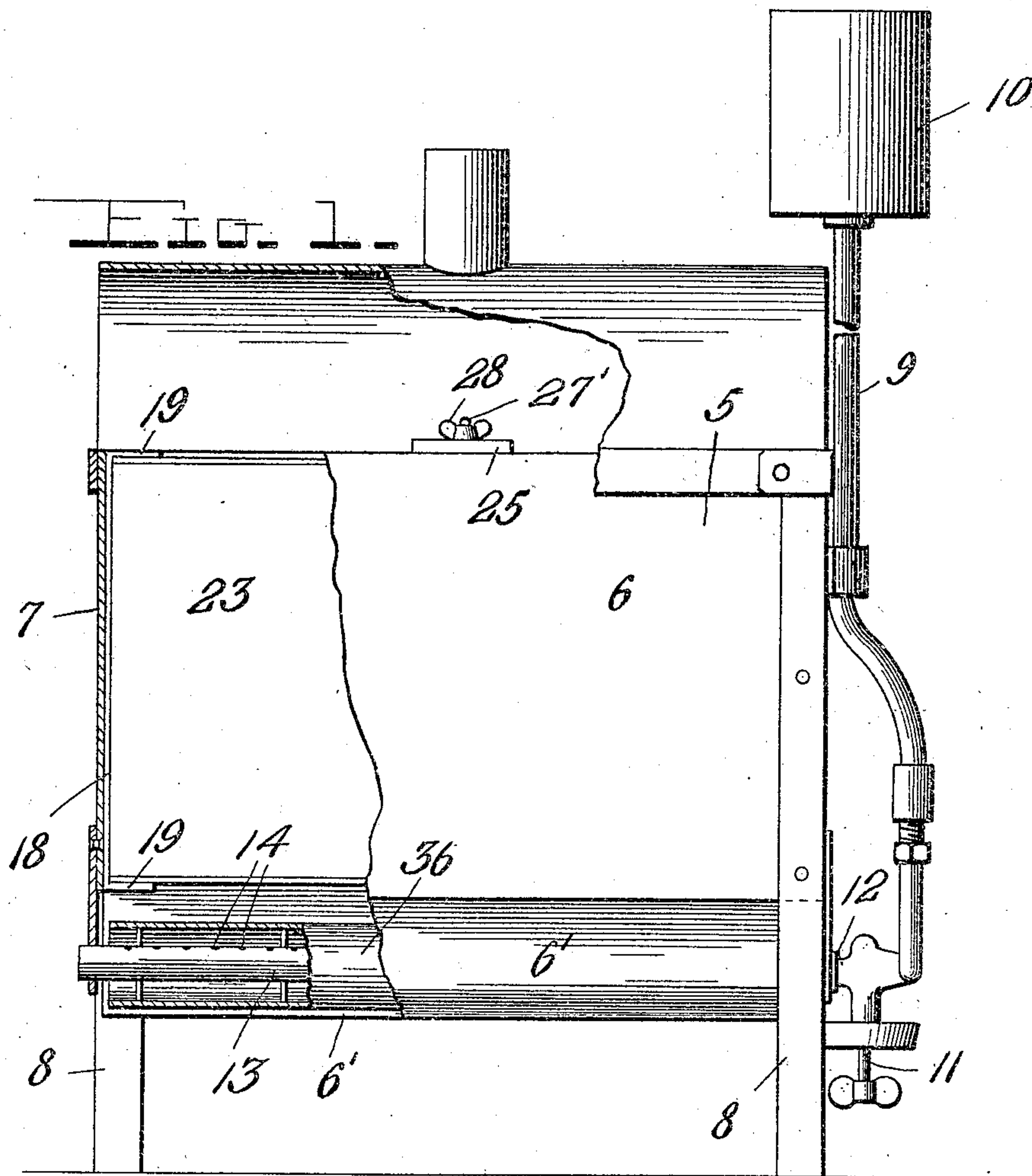


J. O. ELLINGSON.
 PHOTOGRAPHIC PRINT DRYING APPARATUS.
 APPLICATION FILED OCT. 14, 1909.

956,319.

Patented Apr. 26, 1910.

3 SHEETS-SHEET 1.



Witnesses

Chas. R. Griebauer.
 E. M. Ricketts.

By

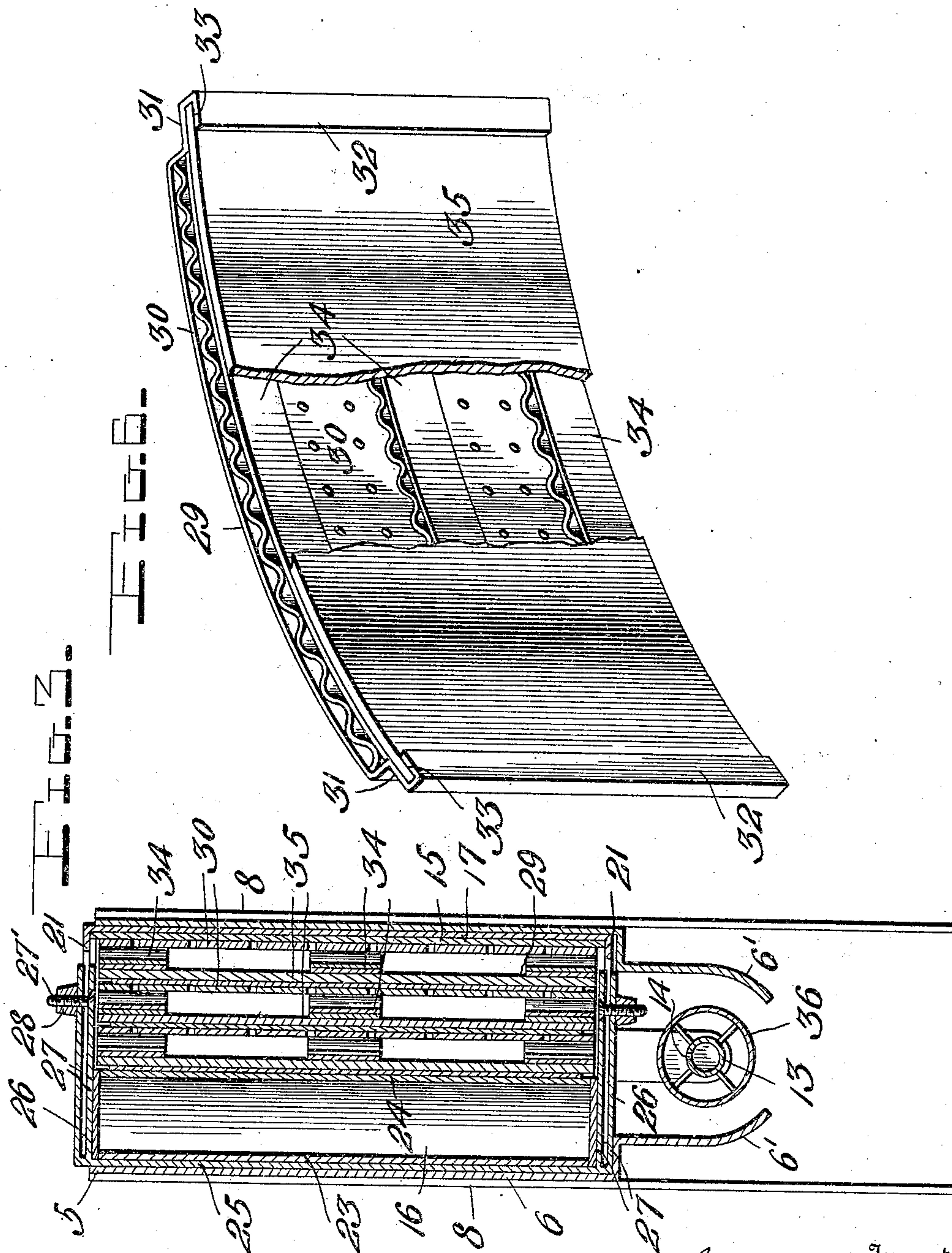
John O. Ellingson
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 4.

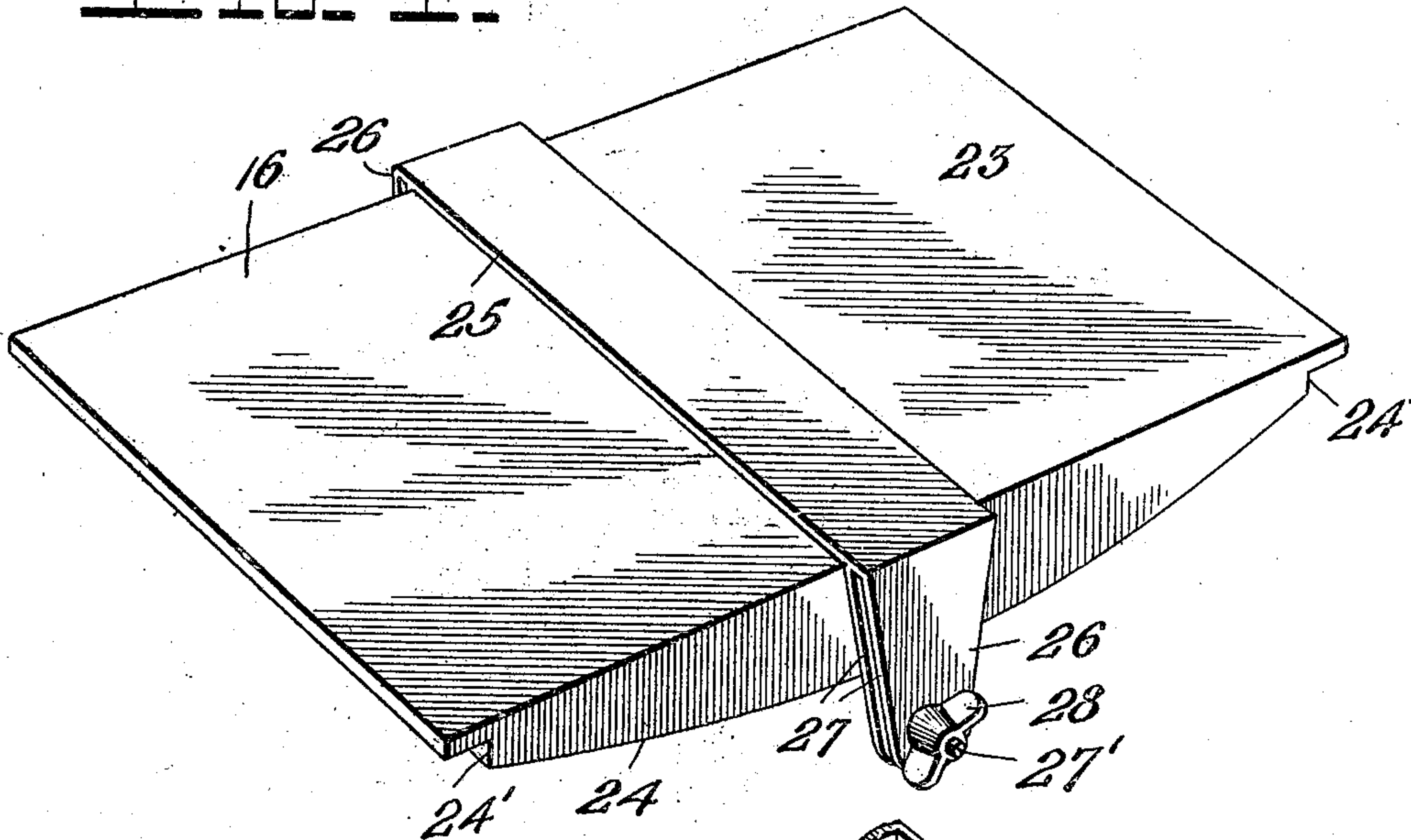
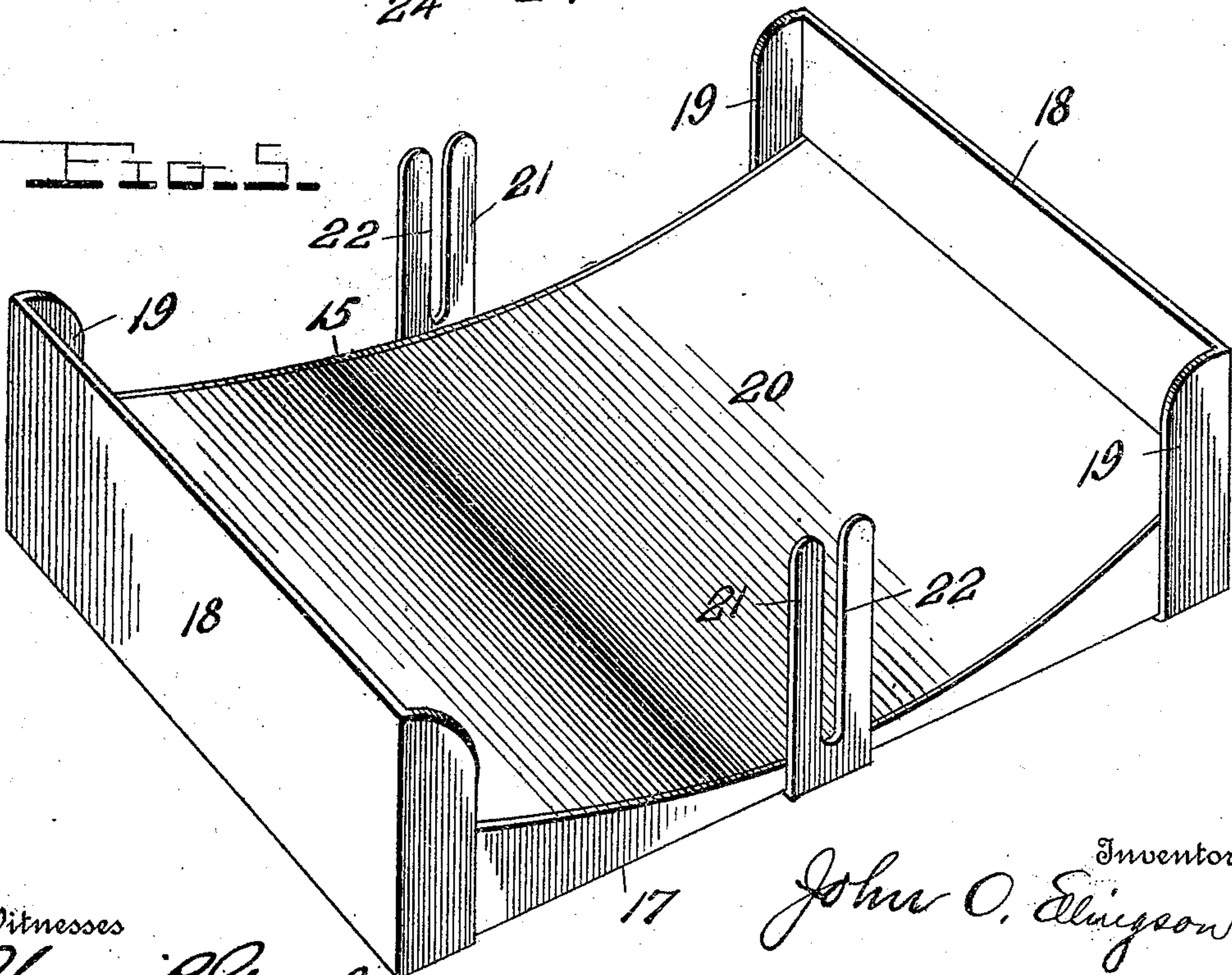


Fig. 5.



Witnesses

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ABRAHAM B. STOUT.

PHOTOGRAPHIC-PRINT-DRYING APPARATUS.

956,319.

Specification of Letters Patent.

Patented Apr. 26, 1910.

Application filed October 14, 1909. Serial No. 522,644.

To all whom it may concern:

Be it known that I, JOHN O. ELLINGSON, a citizen of the United States, residing at Cambridge, in the county of Furnas and State of Nebraska, have invented certain new and useful Improvements in Photographic-Print-Drying Apparatus, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention has relation to certain new and useful improvements in photographic print drying apparatus, and has for its primary object to produce a device of this character which is designed with a view to prevent curling of the prints after they become dry, with the employment of a minimum number of elements which are so arranged that the apparatus will occupy but small space.

15 A further object is to provide an apparatus for the above purpose, wherein a very novel form of print holder is employed, said holder being comprised of two adjustable members which are adapted to receive between them suitable air conducting elements between which the prints are disposed.

20 A further object is to provide a suitable supporting frame, said frame carrying heating means positioned beneath the print holder whereby the heated air currents will ascend and pass through the conductors, the passage of the air-currents drying the prints.

25 With these and other objects in view, the invention consists of the novel construction, combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

30 Figure 1 is a side elevation of a print drying apparatus constructed in accordance with my invention, one side of the supporting frame being broken away; Fig. 2 is a top plan view; Fig. 3 is a vertical section taken on the line 3—3 of Fig. 2; Figs. 4 and 5 are detail perspective views of the print holding members; Fig. 6 is a similar view of one of the heat conducting members.

35 Referring to the drawings 5 indicates a rectangular supporting frame, which comprises the parallel sides 6 and the ends 7. To each of the corners of this support suitable legs 8 are secured. It is preferably constructed of heavy sheet metal, and at one end of the frame a suitable heating device

is arranged. This heating apparatus comprises a vertically disposed conducting pipe 9 which is secured to one end of the supporting frame 5 and has communication with a gasoline or oil supply tank 10. The lower end of this pipe is transversely disposed and provided with a suitable cut-off valve 11 from which a short pipe 12 laterally extends centrally beneath the frame. It will be noted that the side plates 6 of the supporting frame are transversely extended inwardly toward the longitudinal center of the frame at their lower edges, as shown at 6'. A ledge or shoulder is thus formed from which the plates extend downwardly and are slightly curved inwardly therefrom. Suitably supported from the end of the frame there is a tube 13 which is formed with the longitudinal series of perforations 14. In the operation of the apparatus, the gasoline enters this tube and when lighted the flame is discharged through the openings 14, the heat rising therefrom ascending between the side plates 6 of the supporting frame.

40 A suitable print holding device is received within the frame and supported upon the shoulders 6' formed in the lower ends of the sides thereof. This holder comprises the two adjustable members 15 and 16. As shown the member 15 comprises the body plate 17 and the end plates 18, the upper and lower edges of the end plates being inwardly extended to provide the flanges 19. The side plate 17 also has its upper and lower edges inwardly directed between the flanges 19 and suitably secured thereto is a concave plate 20. Centrally secured upon the side plate 16 and extending across the same there is a strap plate 21, the ends of which are transversely projected and have formed therein the open ended slots 22.

45 The holding member 16 is formed of the body or side plate 23, the opposite edges of which are transversely disposed and have secured thereto the concavo-convex plate 24. It will be noted that the opposite ends of the holding member 16 are reduced in thickness to provide the shoulders 24' which extend entirely across the ends of said member. A strap plate 25 is also secured to the body plate 23 and the ends thereof are transversely disposed as shown at 26. It will, however, be noted upon reference to Fig. 3 that these ends are spaced from the top

and bottom of the holder and arranged in spaced relation thereto and parallel therewith are the plates 27. Between these parallel plates the transverse ends of the strap 21 carried by the holding member 15 are disposed. In the outer ends of the spaced plates 25 and 26 a screw threaded bolt 27' is disposed, the shank of said bolt being disposed in the slot 23 in the plates 22 when the holding members 15 and 16 are arranged in assembled position. Upon the outer ends of the bolts 27' the wing nuts 28 are engaged and are adapted to be threaded thereon to clamp the several plates tightly together and prevent transverse movement of the holding members.

Between the members 15 and 16 the print holding members 29 are arranged. Each of these members is of similar construction and comprises a sheet metal reticulated plate 30, the ends of which are bent to form the shoulders 31 and have their extremities inwardly turned as shown at 32 to form a groove or channel 33. The plates 30 are of concavo-convex form whereby they will conform to the curvature of the opposed inner surface of the holding members 15 and 16. Extending between the shoulders 31 at the ends of each of the plates are the heat conductors 34. While we have shown but three of such conductors in the drawing it will of course be obvious that any desired number may be employed. These conductors are in the form of a corrugated metal strip, the corrugations thereof providing an air passage for the air currents. A heavy sheet of cardboard 35 is positioned on the opposite side of the heat conducting strips and has its opposite ends disposed in the grooves or channels 33 of the holding member.

In the operation of the apparatus, the holders 29 are arranged in the holding member 15 between the flanges 19 of the ends 18, the cardboard 35 being uppermost. As these holders are successively placed within the member 15, a print is laid upon the cardboard 35, face downward. When the next holder is placed in position, the reticulated plate 30 thereof will be disposed against the back of the print. This operation is continued, until the limit of the capacity of the print holder is reached. The other of the holding members 16 is then placed upon the several holding devices 29, the transverse ends of the strap plates being engaged as previously set forth. The holding members are forced together to tightly compress the print holding devices therebetween, when the thumb nuts 28 are threaded on the ends of the stud bolts 27 to secure the members in position. In this manner the prints are securely held against movement between the holding devices, and owing to the curvature of said devices, the tendency of the prints to curl after being removed therefrom is ob-

viated, the prints being curved when in the holder in the opposite direction to the natural curling of the prints as commonly seen during the drying process. After the prints have thus been arranged in the holder, the holder is placed within the supporting frame 5, the lower longitudinal edge thereof resting upon the shoulders 6' of the sides of said frame. The heating apparatus is then lighted and the heated air will ascend from the flame tube arranged beneath the holder, and pass between the corrugations of the strips 34, and through the perforations of the reticulated plate 30, directly into contact with the print which is arranged between said plate and the cardboard 35 of the adjacent holding device. Thus the prints will be rapidly and effectually dried, and when removed from the holder they will lie perfectly flat and retain their shape indefinitely regardless of any variations of the atmospheric temperature.

While we have shown and described means for applying the heat to the print holder, it will of course be understood that there are a great many different forms of such apparatus which may be successfully employed for the purpose set forth, and we therefore do not wish to be limited to the exact construction and arrangement of such apparatus. However, in the construction of such heating device, the longitudinally extending flame tube will preferably be disposed within a drum 36, to overcome any possibility of the flame igniting the cardboard strips of the holding device. This drum will receive the heat from the tube, from whence the heat will rise between the print holding devices. The efficiency of the apparatus is in no wise detracted from by such an arrangement, and the drying operation is not prolonged thereby to any appreciable extent.

From the foregoing it will be seen that we have provided a heat drying apparatus for photographic prints which is of comparatively simple construction and will rapidly and thoroughly dry the prints and prevent their curling when removed from the holder.

The print holder may be constructed of various sizes, and the supporting frame also may be so proportioned as to receive any desired number of said holders. The two separable members of the print holders may be very quickly assembled and disassembled for the arrangement and removal of the prints therefrom.

The apparatus is entirely constructed of sheet metal with the exception of the holding devices 29, and its durability and efficiency in use are thus increased to a considerable extent, without incurring any additional expense in its manufacture.

It will be obvious that there are numerous minor modifications which may be resorted

to, without materially departing from the essential features or sacrificing any of the advantages of my invention.

Having thus described the invention, what is claimed is:

1. In an apparatus of the character described, the combination with a supporting frame, of a print holder arranged within said frame, said holder comprising two separable sections, means for holding a plurality of prints between said sections, means for securing said sections together, and a heating apparatus arranged beneath said frame, the heated air therefrom rising between the holder sections and contacting with said prints.

2. In an apparatus of the character described, the combination with a supporting frame, of a print holder disposed within said frame, the bottom of said frame being open, said holder comprising two separable sections having concavo-convex opposed surfaces, print holding devices arranged between said sections to secure the prints therebetween, means for securing said sections together, and a heating apparatus adapted to discharge heated air currents beneath said frame, said air currents rising between the holder sections and contacting with said prints.

3. In an apparatus of the character described, the combination with a supporting frame comprising parallel sides and ends, the lower edges of said sides being transversely and longitudinally extended to form shoulders thereon, of a print holder disposed within said frame and supported on said shoulders, said holder comprising two adjustable sections, means for confining a plurality of prints between said sections, means for securing said sections in their adjusted position, and means for directing heated air between said sections into contact with said prints.

4. In an apparatus of the character described, the combination with a supporting frame, the sides of said frame having opposed longitudinal shoulders at their lower edges, a print holder adapted to be positioned in said frame and seated on said shoulders, said holder comprising two adjustable sections, said sections having opposed concavo-convex surfaces, a plurality of reticulated plates arranged between said sections, means for spacing said plates, means for securing said sections in their adjusted position, and means extending beneath the supporting frame for directing heated air currents between said plates into contact with said prints.

5. In an apparatus of the character described, the combination with a holder receiving frame, of a print holder positioned in said frame, said holder comprising two adjustable sections, one of said sections

being disposed and movable between the ends of the other of said sections, a plurality of concavo-convex reticulated plates arranged between said sections, corrugated strips disposed between and spacing said plates, means for securing said sections in their adjusted position, and means for directing heated air currents between the corrugations of said strips against said plates into contact with the prints.

6. In an apparatus of the character described, the combination with a holder receiving frame, of a print holder disposed within said frame, said holder comprising two transversely adjustable sections, one of said sections being movable between the ends of the other section, a plurality of reticulated plates arranged between the opposed faces of said sections, a plurality of longitudinally disposed corrugated strips between the adjacent plates, a cardboard back removably carried by each of said plates, means for securing said sections in their adjusted position, and means disposed beneath said frame for discharging heated air currents between the corrugations of said strips against said plates and into contact with the prints.

7. In an apparatus of the character described, the combination with a holder receiving frame, of a print holder adapted to be positioned therein, said holder comprising two adjustable sections, said sections having concavo-convex opposed surfaces, a plurality of concavo-convex reticulated plates arranged between said sections, a plurality of corrugated strips secured to each of said plates and spacing the same, a cardboard back removably carried by each of said plates and covering said strips, the opposed surfaces of the adjacent plates and cardboard backs being adapted to receive a plurality of prints therebetween, and a heat generating device disposed beneath said holder and adapted to direct heated air currents between the corrugations of said strips and said plates into contact with the prints.

8. In an apparatus of the character described, the combination with a holder receiving frame, of a print holder positioned therein, said holder comprising two transversely adjustable sections, one of said sections comprising a side plate and transversely extending end plates, the upper and lower edges of said end plates having laterally and inwardly directed flanges, the other of said sections being disposed and movable between said flanges, said sections having opposed concavo-convex surfaces, a plurality of reticulated plates arranged between said sections, heat conducting means disposed between the adjacent plates, a removable cardboard back carried by each of said plates and disposed over said heat conducting means, the back of each of said plates being disposed upon each adjacent plate, means

for securing said sections in their adjusted position, and heat generating means disposed beneath said holder and adapted to direct heated air currents between said plates into
5 contact with the prints.

9. In an apparatus of the character described, the combination with a holder receiving frame, of a holder adapted to be arranged therein, said holder comprising
10 two transversely adjustable sections, each of said sections having a transversely extending plate centrally arranged at its upper and lower edges, said plates being slidable on each other, a plurality of print holding mem-
15 bers arranged between said sections, said members being adapted to receive a plurality of prints therebetween, means carried by one of said slidable plates for securing said sections together, and means for discharging
20 heated air currents between said sections and into contact with the prints.

10. In an apparatus of the character described, the combination with a holder receiving frame, of a print holder adapted to
25 be disposed within said frame, said holder comprising two transversely adjustable sections, each of said sections having centrally secured to the upper and lower edges thereof a transversely extending plate, the plates of
30 one of said sections having an open ended slot therein, the plates of the other of said sections carrying a bolt adapted to be received in said slots, a winged nut engaged on the outer ends of said bolts to secure the
35 sections in their adjusted positions, means for securing a plurality of prints between said sections in spaced relation to each other, and means carried by said receiving frame for directing heated air currents between
40 said sections and into contact with the prints.

11. In an apparatus of the character described, the combination with a holder receiving frame, of a heating apparatus carried by said frame, said apparatus comprising
45 a supply tank and pipe and a flame tube extending centrally and longitudinally beneath said frame, the lower end of said frame being open, a drum supported from said frame and surrounding said tube, and a print holder
50 disposed within said frame, said holder comprising two adjustable sections, means for securing a plurality of prints between said sections in spaced relation to each other, said drum being adapted to discharge the
55 heat from said heating apparatus between the sections of said holder into contact with the prints.

12. A print holder comprising two transversely adjustable sections, one of said sections consisting of side and end plates, the
60 upper and lower edges of said end plates having inwardly extending flanges, the other of said sections comprising a body plate having upper and lower transversely extending edges, said edges being convex in

form and adapted to receive the plate therebetween, the ends of said sections being provided with reduced portions forming shoulders, said reduced portions being disposed between the flanges of said first mentioned section, the opposed surfaces of said
70 sections being concentrically parallel, a plurality of print holding members arranged between said sections, said members being adapted to receive and confine a plurality of
75 prints in spaced relation therebetween, and means for securing said sections in their adjusted position.

13. A print holder comprising two transversely adjustable sections, one of said sections being movable between the ends of
80 the other section, each of said sections having centrally secured thereto a transversely extending plate, said plates being slidably engaged upon each other, one of said plates
85 having an open-ended slot therein adapted to receive the bolt carried by the other of said plates, a thumb nut threaded on said bolt and adapted to secure said plates and sections in their adjusted position, one of
90 said sections having a convex surface, the other of said sections having a concave inner surface concentrically disposed to the opposed surface of the first named section, and a plurality of reticulated plates ar-
95 ranged between said sections, said plates being spaced from each other and adapted to support and confine a plurality of prints therebetween, the perforations in said plates permitting of the free circulation of air be-
100 tween the sections for contact with said prints.

14. A print holder comprising two transversely adjustable sections, one of said sections having two parallel transversely dis-
105 posed plates centrally secured at its upper and lower edges, the other of said sections having a single centrally arranged transverse plate having an open-ended slot therein adapted to receive a bolt carried by the
110 first named plates, a clamping nut engaged upon the outer end of said bolt, said sections having opposed concavo-convex surfaces, a plurality of reticulated plates arranged in spaced relation between said sections, the
115 ends of said plates being bent upon themselves to form channels, a cardboard back removably disposed in said channels in each of said plates, and air conducting means arranged between said plates and cardboard
120 and adapted to direct the air currents through the plates into engagement with the prints which are adapted to be confined between the plate and the adjacent cardboard back.
125

15. A print holder comprising two transversely adjustable sections, said sections having opposed concavo-convex surfaces, a plurality of reticulated concavo-convex plates arranged between said sections, the opposite
130

ends of said plates having shoulders formed thereon and bent upon themselves to form vertical channels, a cardboard back removably carried by each of said plates having
5 its ends disposed in said channels, a plurality of corrugated strips arranged between said plates and cardboard and adapted to conduct the air currents therebetween through the perforations in said plates and
10 into contact with the prints, said prints be-

ing disposed between the plate and the cardboard carried by the adjacent plate, and means for securing said sections together.

In testimony whereof I hereunto affix my signature in the presence of two witnesses. 15

JOHN O. ELLINGSON.

Witnesses:

B. F. BUTLER,

M. A. ELLINGSON.