

(No Model.)

2 Sheets—Sheet 1.

P. SIEVERT.

APPARATUS FOR PRODUCING FLAT OBJECTS OF GLASS.

No. 528,240.

Patented Oct. 30, 1894.

Fig. 1.

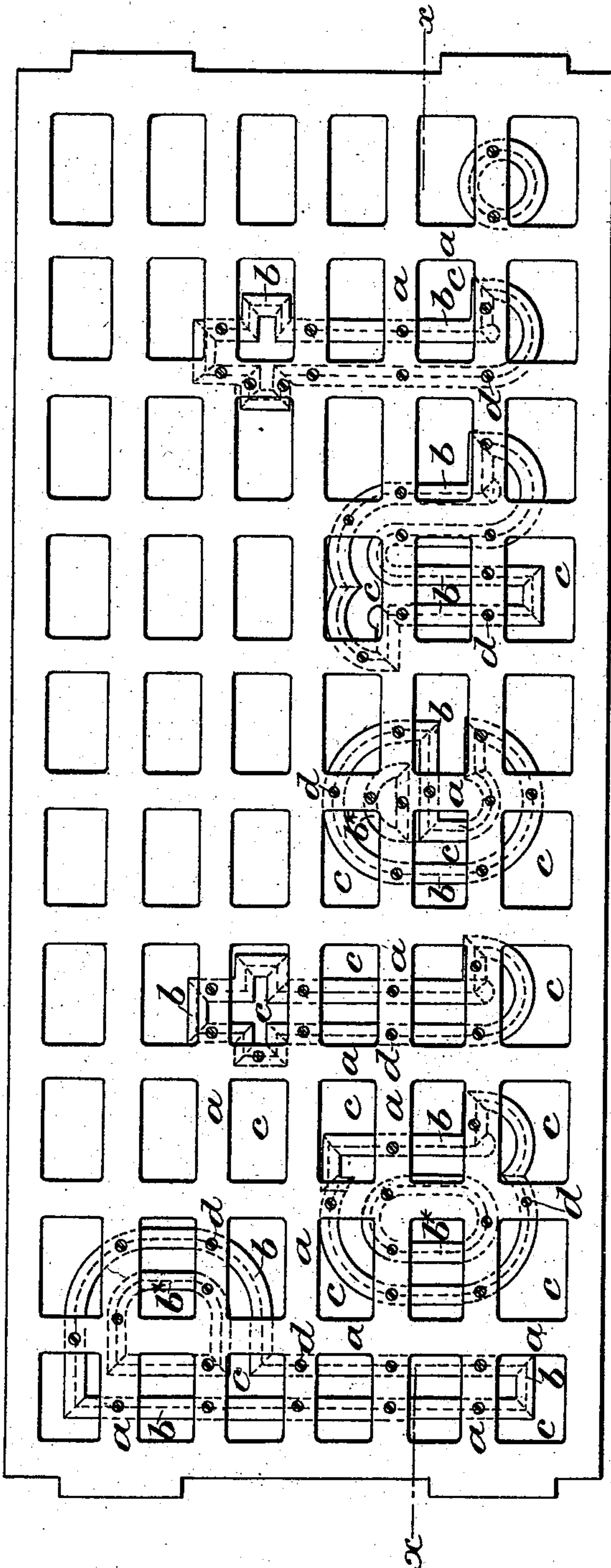


Fig. 2.



Witnesses:
George Barry,
O. Sundgren

Inventor:
Paul Sievert
by attorneys
Frost & Lewand

(No Model.)

2 Sheets—Sheet 2.

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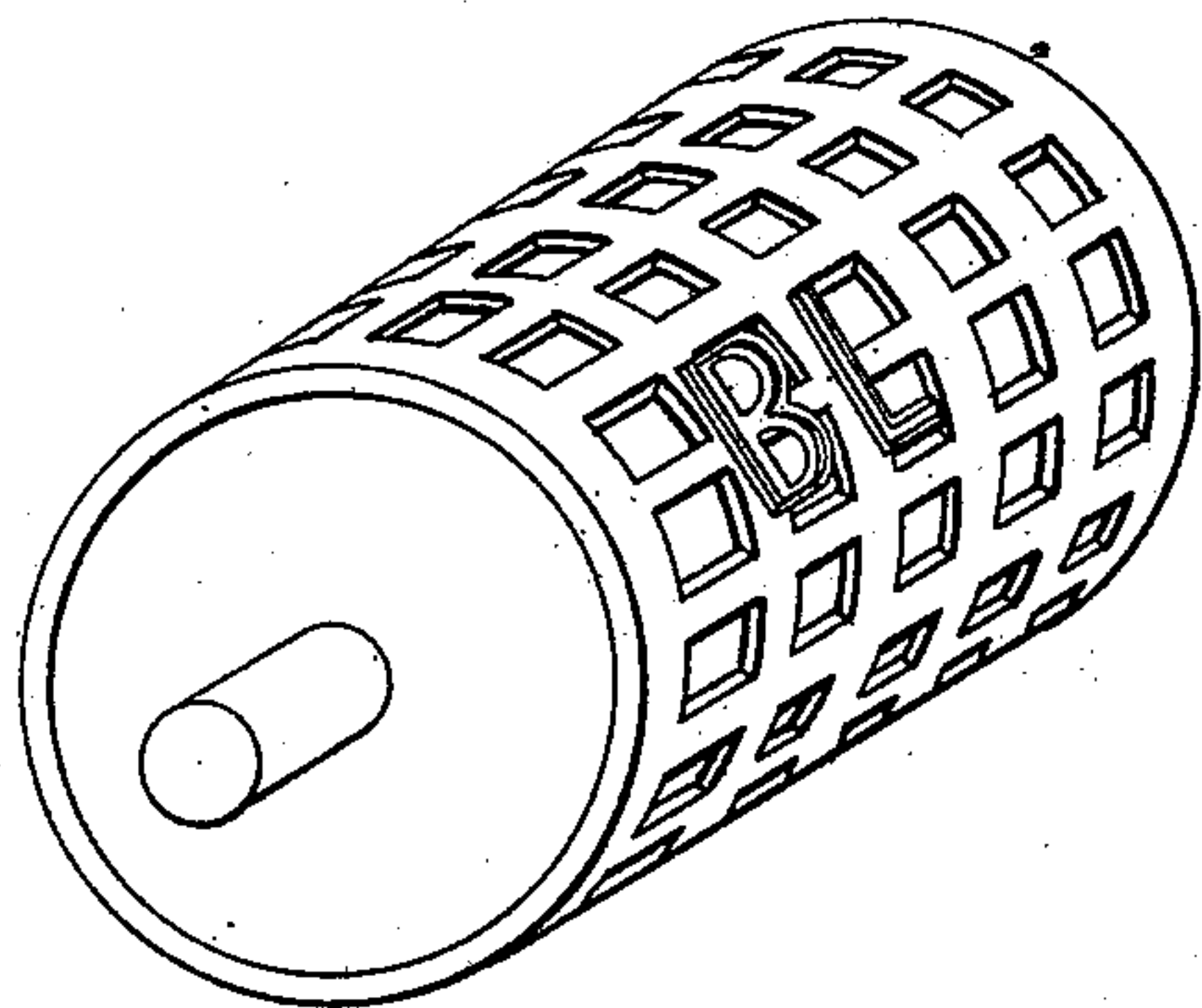


Fig. 3.

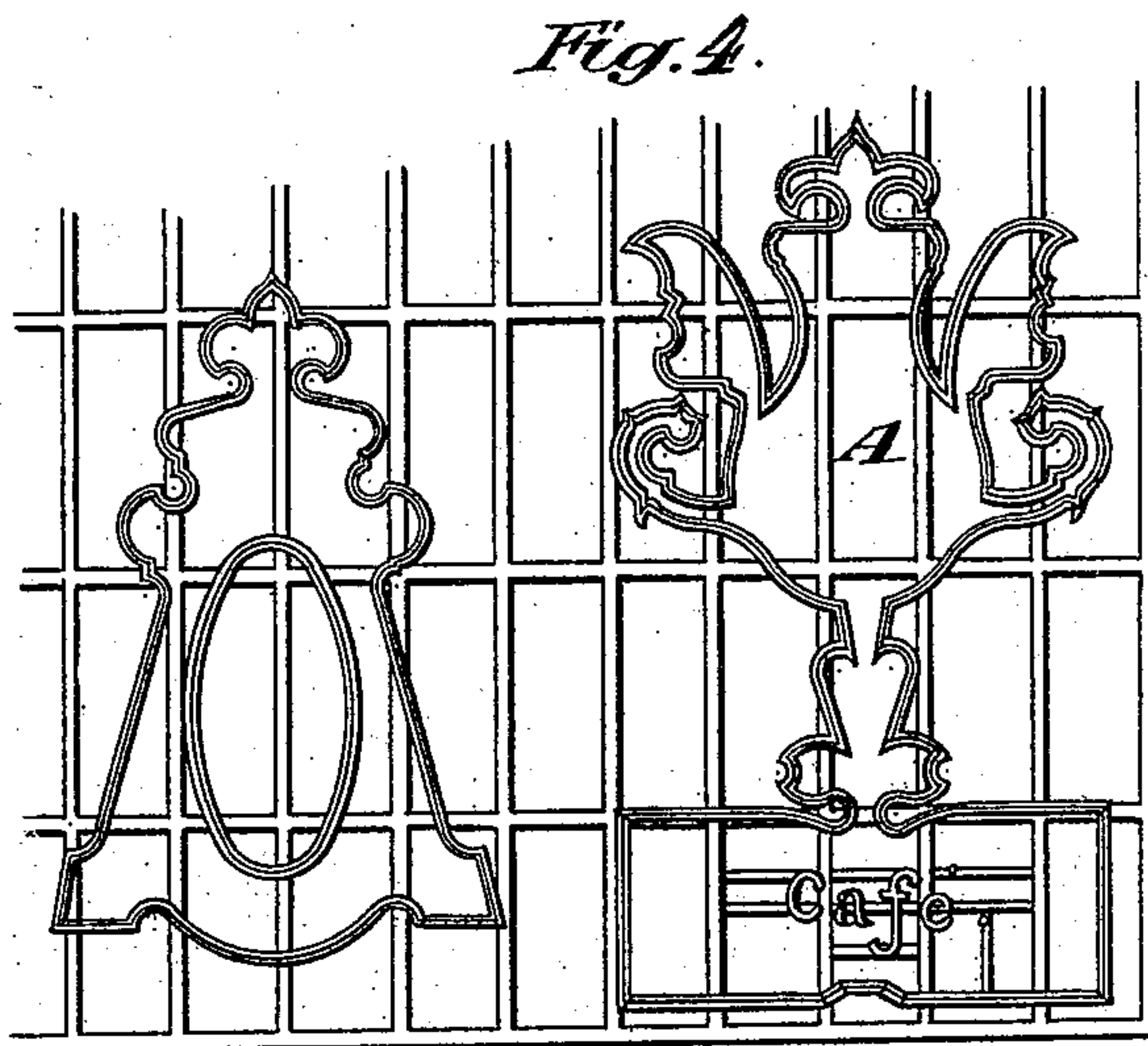


Fig. 4.

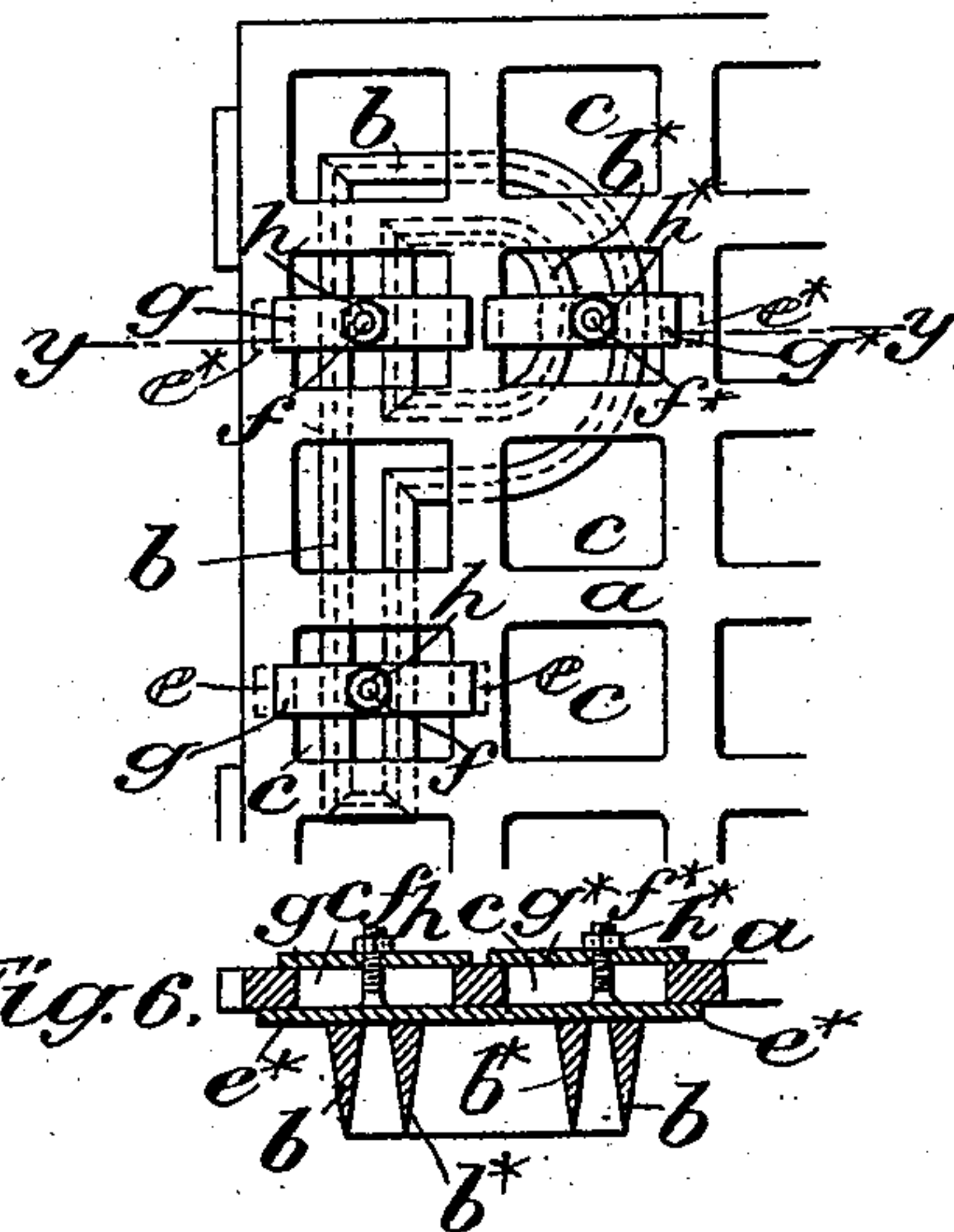


Fig. 5.

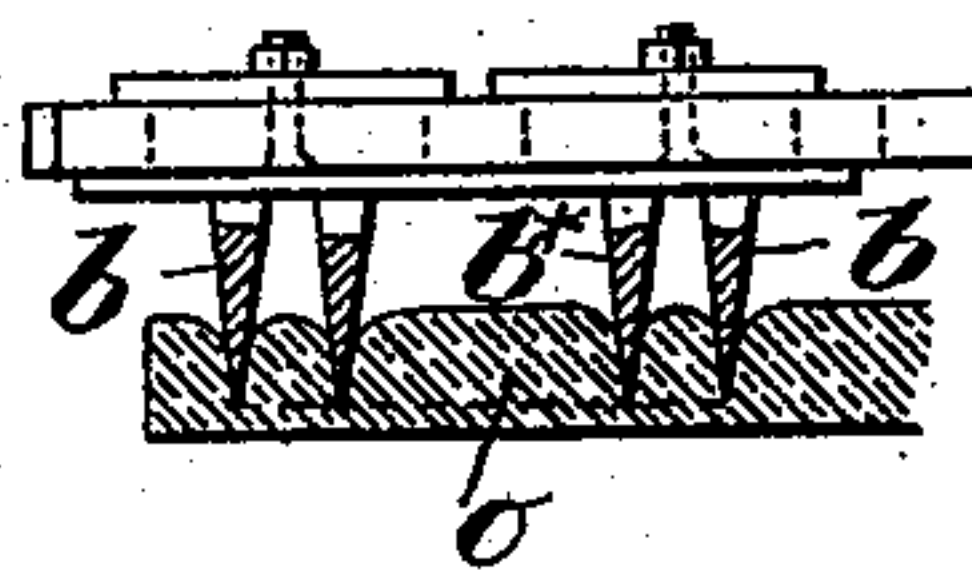


Fig. 7.

Witnesses:-
George Barry.
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Paul Sievert
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UNITED STATES PATENT OFFICE.

PAUL SIEVERT, OF DÖHLEN, GERMANY.

APPARATUS FOR PRODUCING FLAT OBJECTS OF GLASS.

SPECIFICATION forming part of Letters Patent No. 528,240, dated October 30, 1894.

Application filed December 18, 1893. Serial No. 493,973. (No model.) Patented in France September 29, 1892, No. 224,636; in Germany January 14, 1893, No. 71,635; in Belgium May 5, 1893, No. 104,539, and in England May 11, 1893, No. 9,466.

To all whom it may concern:

Be it known that I, PAUL SIEVERT, of Döhlen, near Dresden, in the Kingdom of Saxony, German Empire, have invented certain new and useful Improvements in Apparatus for Producing Flat Objects of Glass and for Ornamenting Sheets of Glass, of which the following is a specification, and for which patents have been obtained as follows: in Germany by patent of addition, No. 71,635, dated January 14, 1893; in France by certificate of addition, dated February 13, 1893, to French patent No. 224,636, dated September 29, 1892; in Belgium by brevet de perfectionnement No. 104,539, dated May 5, 1893, and in Great Britain by Patent No. 9,466, dated May 11, 1893.

This invention relates to the stamping of flat objects of glass from a sheet of molten glass and especially to the stamping of such flat objects in such a way that they are left adhering to the sheet to be separated therefrom by grinding, as described in my application, Serial No. 450,674, filed November 1, 1892, for United States patent. The stamping of the objects from the sheet is performed by means of patterns or dies provided on a base consisting of a flat plate or a roller and the present invention relates chiefly to the construction of such base and to the means of fastening thereto the fillets or strips which constitute the patterns or dies whereby the said patterns or dies may be easily changed. According to the present invention the said plate or roller is constructed with bars in a skeleton form and the strips which correspond in form with the outlines of the objects to be produced and which constitute the patterns or open dies are fixed directly by screws or pins or indirectly by counter-plates and screw-bolts on the said bars or skeleton structure.

The skeleton or barred construction offers the following substantial advantages: The surface of the roller or plate being thus broken up almost entirely with openings, the reflected heat from the glass sheet, over which the roller travels, or upon which the plate is pressed, acts on the roller or plate in a totally different manner, than when the plate or roller surface is solid. The solid or plain upper surface is, by reason of its necessary thick-

ness and solidity, always comparatively cool on the top, *i. e.*, opposite the hot glass sheet, and chills the latter, the plastic condition of which should not be allowed to fall below a certain point, in order to impart a good shape to the objects to be pressed out. When the heat can rise through and permeate the roller or plate, it heats all parts of the same uniformly, and thereby the necessary plasticity of the glass sheet is not impaired. In addition, when employing the solid rollers or plates, the air imprisoned in the spaces formed by the devices, acts prejudicially on the glass sheet and on the surface of the stamped articles; while with the skeleton or barred roller or plate, the air can escape through the multitudinous perforations.

When fixing the pattern to the rollers or plates, the skeleton or barred construction also offers substantial advantages. The taper pieces which are to form the outline of the articles to be stamped, letters, numerals, figures, ornaments, &c., are easily modeled in wood or other suitable material, and can then be cast separately from and affixed to the grid plate or frame.

When making patterns for skeleton or barred rollers, the parts are made in some flexible material, such as wax, tin, lead, &c., or in a composition, and then bent to the curve of the roller's surface, and the patterns in this bent form serve to cast from, in some material capable of withstanding the heat of the glass sheet. These pieces are then affixed to the bars or skeleton surface of the roller.

It is obvious that the fitting of the skeleton or barred rollers or plates with patterns or open dies offers many advantages over the production of the rollers or plates and dies in one piece; also, finishing off the sharp edges and sides of the dies with a file, to clean the castings, or to renew them after long use, is made much easier, when the dies have open spaces, and can be removed from the rollers or plates, than when the die and roller or plate are all in one piece or casting. A most substantial advantage over the fixed dies is gained by the movable kind, in that the different sorts of dies forming letters, numerals, figures, ornaments, &c., can be

turned and twisted about so that some devices little called for in business, can be removed from the roller or plate and replaced by figures, &c., more frequently used.

5 In addition, complete arrangements, or composite decorations in flat glass, can be stamped out, these arrangements or decorations being built up on the skeleton cylinder or plate from separate straight, corner and
10 center pieces, arranged together, which arrangements or composite decorations can be taken to pieces, and re-arranged with the same pieces, in any convenient manner. By thus stamping, or pressing, by means of these
15 dies mounted upon the skeleton cylinder, plate or frame, glass objects are produced having their under side flat and the edges of the pattern rounded. The articles thus produced are satisfactory to the eye, inasmuch as
20 they present a smooth rounded pattern on the upper surface with no sharp edges. The production of the rounded off pattern on the upper surface of these flat stamped out objects, is effected merely by the pressure of the dies
25 in the plastic glass sheet, without any lateral pressure on the glass within the dies. This result is favored by the perforations in the skeleton frame and roller, as the air (not imprisoned) is free to escape through the open
30 spaces in the cylinder or plate, and consequently does not affect the surface of the glass, which rises between the slanting walls of the dies, which direct it slightly inward, and round off the upper surface.

35 The skeleton or barred roller or plate with the taper dies thereon may be advantageously used for impressing figures, ornaments, letters, or numerals, in plastic sheets of glass down to a certain depth, and afterward grinding the sheets on one or both sides, so that
40 ornamented sheets are produced, which, by the sloping sides of such impressions, will have a very handsome decorative and brilliant appearance.

45 The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a back view of a skeleton plate or frame and attached dies embodying my invention. Fig. 2 represents a transverse
50 section in the line $x x$ of Fig. 1. Fig. 3 is an isometrical view illustrating my invention as adapted to a skeleton roller or cylindrical skeleton frame. Fig. 4 represents a plan of part of a skeleton frame with two patterns
55 or dies of different kinds attached. Fig. 5 is a back view of part of a skeleton plate and attached patterns or dies illustrating a modification of the means of attachment shown in Fig. 1. Fig. 6 represents a transverse section in the line $y y$ of Fig. 5. Fig. 7 represents a side view of part of a skeleton plate and attached die and a section of a sheet of
60 glass on which the said die is in operation.

The bars a forming the frame (see Fig. 1)
65 can be made in any convenient shape, either rectangular, as shown, or of any other suit-

able angle, in regular or irregular arrangement. The plate is furnished with letters on the back which form (for example) the word "Patent." The separate letters are formed
70 by means of taper strips b . It is necessary, for the formation of each letter, to use as many taper strips as the form of the letter demands. For example, the letters "Pa" and "e," on account of the closed parts of
75 the same, require the strips b and b^* , while the letters "t" and "n" only require one taper strip b .

By making the plate of barred or skeleton form, spaces c are provided between the strips
80 forming a letter and the plate, so that the air, during the pressing or rolling operation, can escape through the spaces c , and also the radiating heat from the glass surface can play upon the bars, and thus warm them
85 through.

As shown in Figs. 1 and 2, the strips may be secured by means of small screws d to the bars a , which small screws pass through the bars, and then into the broad base of the
90 taper strips $b b^*$.

A method of fastening the strips shown in Figs. 5 and 6, can also be used, that is to say:—The strips $b b^*$ forming the letters, figures, numerals, &c., are furnished with cross bars
95 $e e^*$. From these cross bars rise the stud bolts $f f^*$, which will be so arranged as to pass through one or more spaces c in the plate. On the other side of the plate, corresponding counter cross bars $g g^*$ are placed upon the
100 bolts, and screwed down by means of nuts $h h^*$. By this kind of fastening the necessity for boring holes in the bars of the plate and the strips for screws is rendered unnecessary. Mounting and replacing the dies on the frame
105 or skeleton plate is also rendered easy of execution in this way.

The plate with the strips forming the articles, is used in the manner shown in Fig. 2, the strips being pressed into the hot plastic
110 glass sheet o to wholly or partially stamp out from, or to only impress their form in, the glass sheet.

All the foregoing, with respect to the manipulation and arrangement of the skeleton
115 or barred frame, and the method of fixing the dies, applies equally well to the skeleton or grid framed roller shown in Fig. 3 in isometrical view.

The skeleton or bar framework can be constructed from bars in any suitable way, and the mounting (or fixing) of the dies forming the patterns can be directly as Fig. 1 and e , or indirectly, as Figs. 5 and 6, applied to the surface of the roller or cylinder. It is, how-
125 ever, self evident that the dies must be curved to correspond with the curve of the cylinder.

Fig. 7 shows how the plastic glass mass o takes its flat under side and curved upper surface when the dies $b b^*$ are pressed into it.
130

In Fig. 4 are shown, by way of example, two composite figures formed of pieces, of

which the left hand one forms a frame, inclosing an oval opening, which frame may be stamped out of the still plastic glass mass, or else the inner and outer contours of the same are so far pressed into the glass surface, as to still form one with the sheet, and then ground on one or both sides, to enable them to be cut from the sheet by the grinding process, or to be otherwise easily removed. The figure on the right hand is a decoration A, to be used in combination with letters, the strips forming this decoration, and the letters, serving to stamp into the plastic glass mass, to decorate the same. The strips of both patterns of Fig. 4 are mounted on the skeleton or barred form of plate.

The process herein described of stamping a figure or design in a sheet of glass while in a plastic state and afterward cutting the said figures or designs therefrom by grinding one side of the sheet is not a part of the present invention, neither is the flat glass-ware thus produced, but the said process is the subject of my application for United States Letters Patent, Serial No. 450,674, filed November 1, 1892, and the said glass-ware is the subject of

my application for United States Letters Patent, Serial No. 505,832, filed March 31, 1894.

What I claim as my invention is—

1. The combination with a base of skeleton form composed of bars, of fillets forming figures or patterns secured to said base, said base and fillets constituting a die through which openings are left inside and outside of the outlines of the so formed figures, substantially as herein described.

2. The combination of the base of skeleton or grid form, the dies furnished with cross bars *e e** lying against the exterior of said base and with stud bolts *f f** projecting through said base, and the counter cross bars *g g** and nuts *h h** applied to said stud bolts at the back of said base, substantially as herein set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

PAUL SIEVERT.

Witnesses:

GEORG RICHTER,

WILHELM WIESENHÜTTER.