

(No Model.)

3 Sheets—Sheet 1.

F. B. HOWARD.
MACHINE FOR COMPRESSING PULP.

No. 513,017.

Patented Jan. 16, 1894.

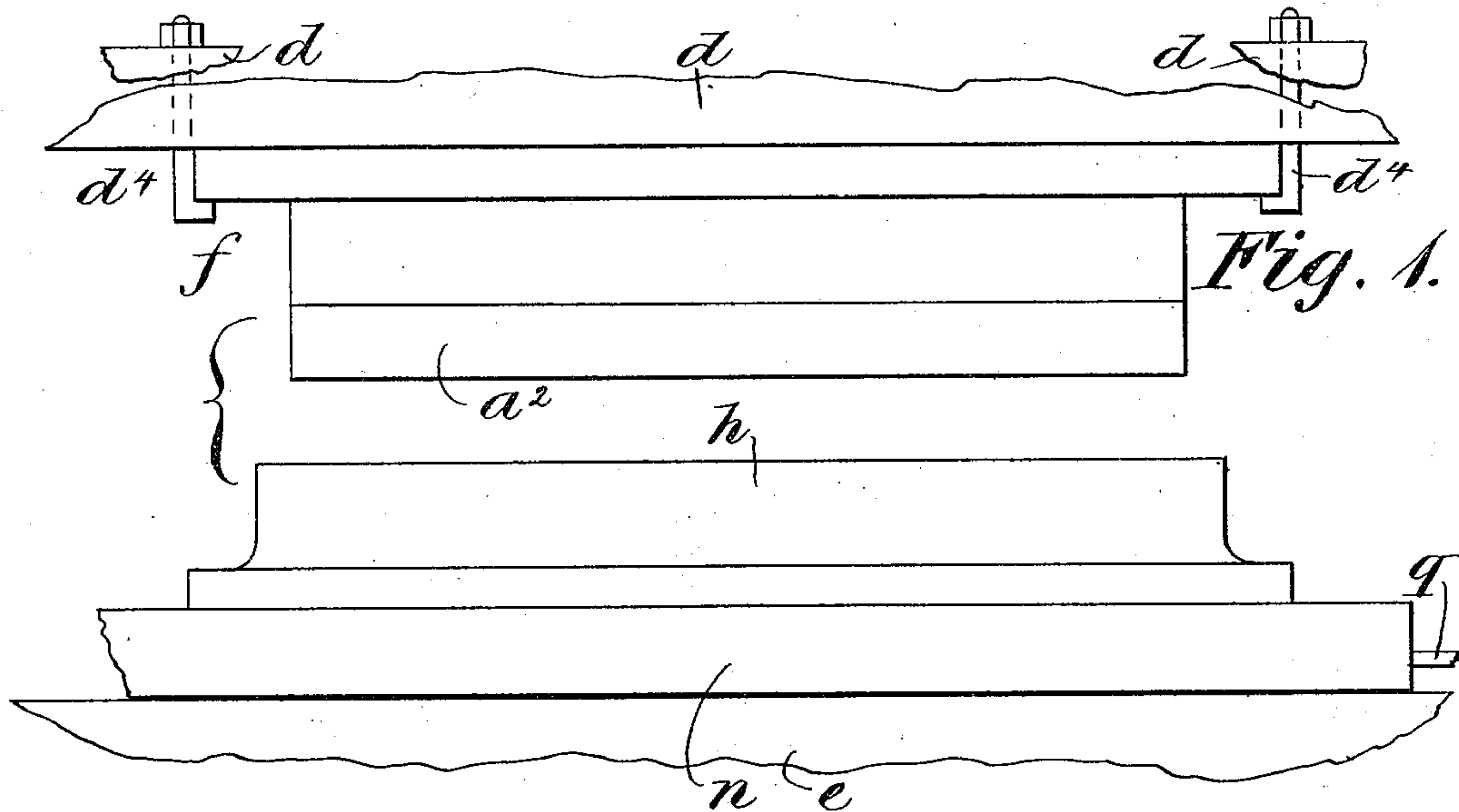


Fig. 1.

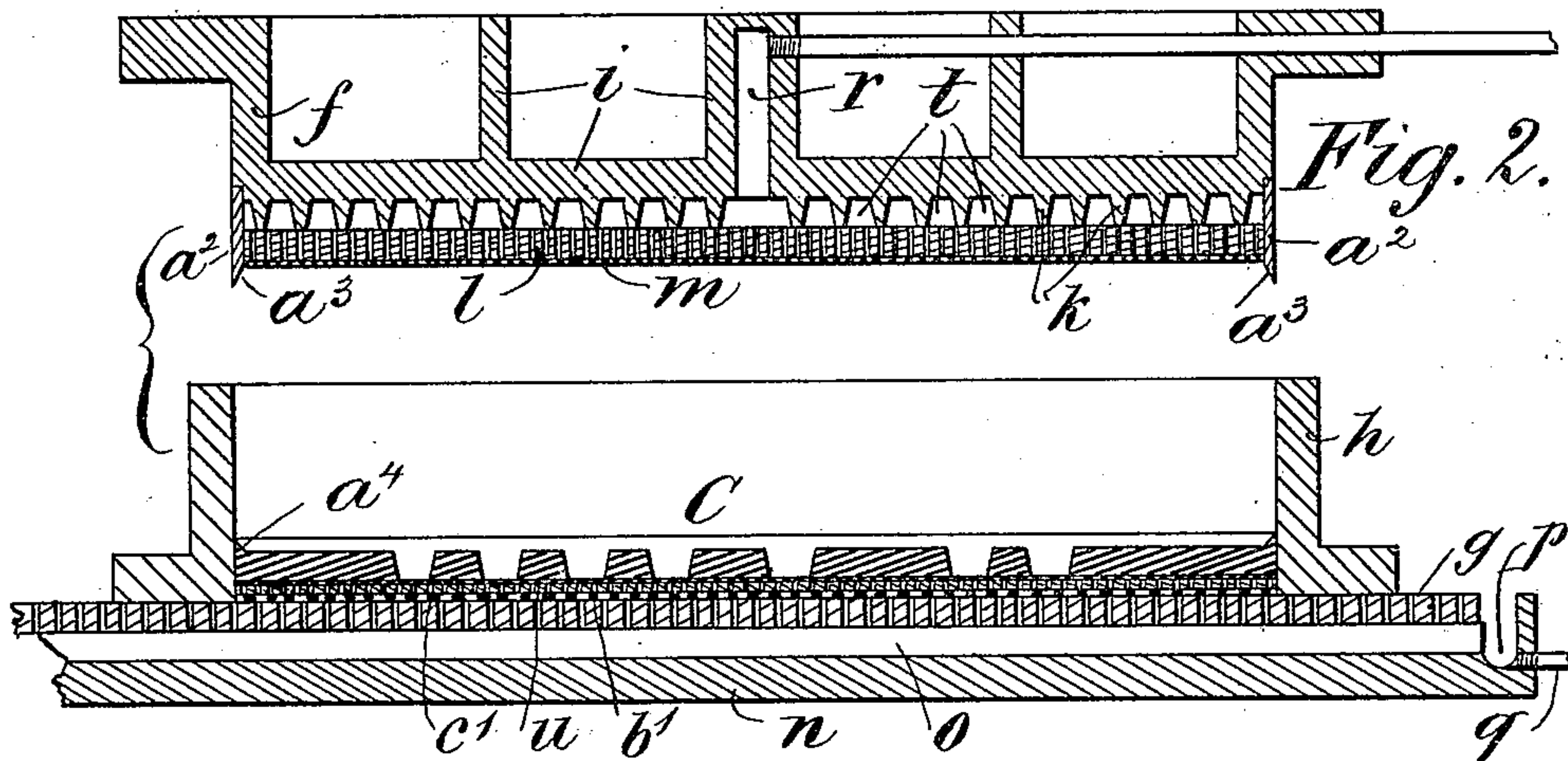


Fig. 2.

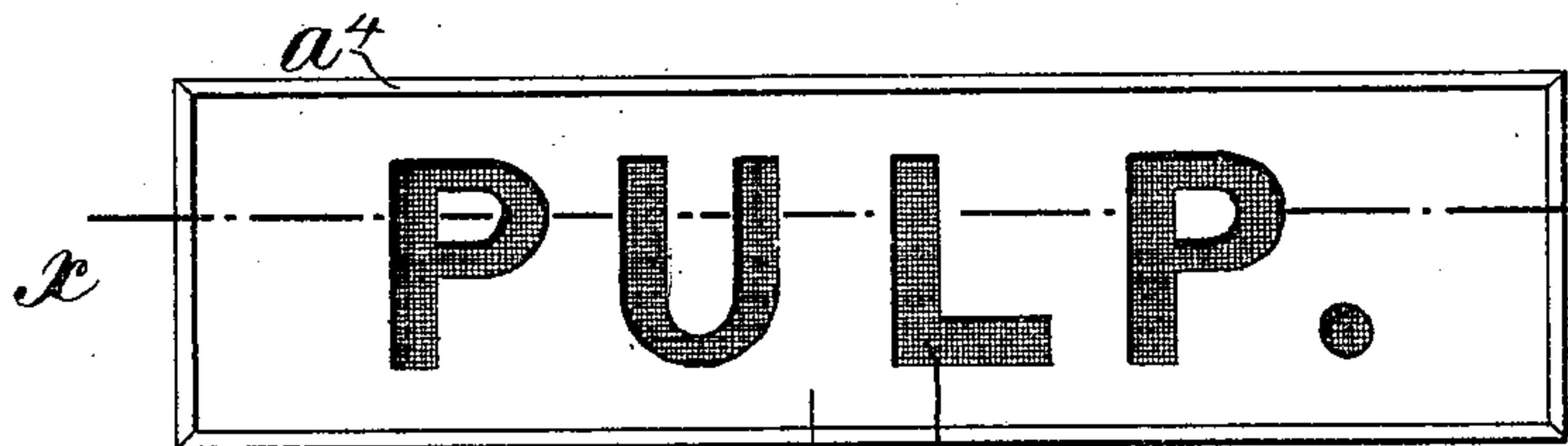


Fig. 3.

Witnesses.

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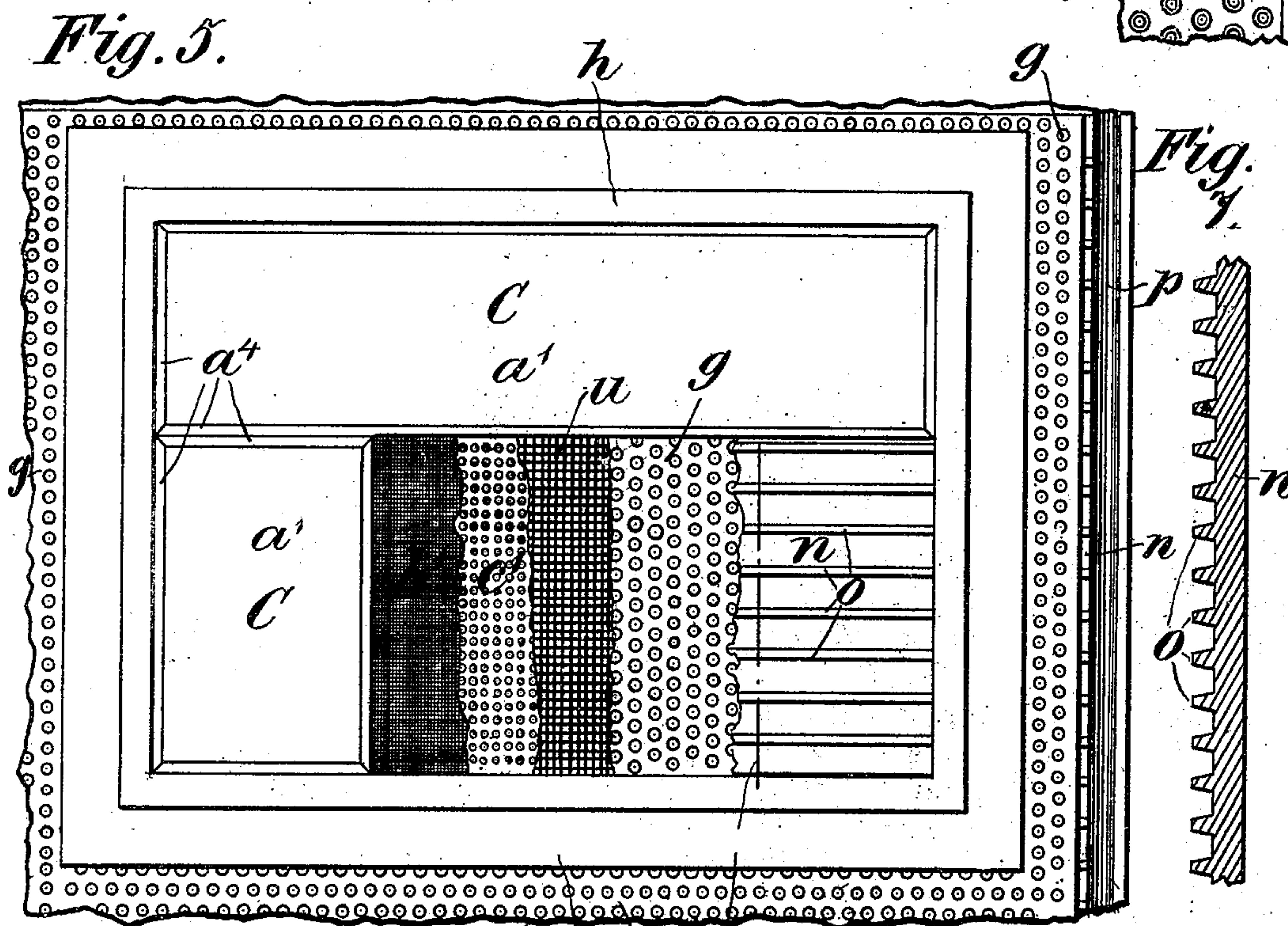
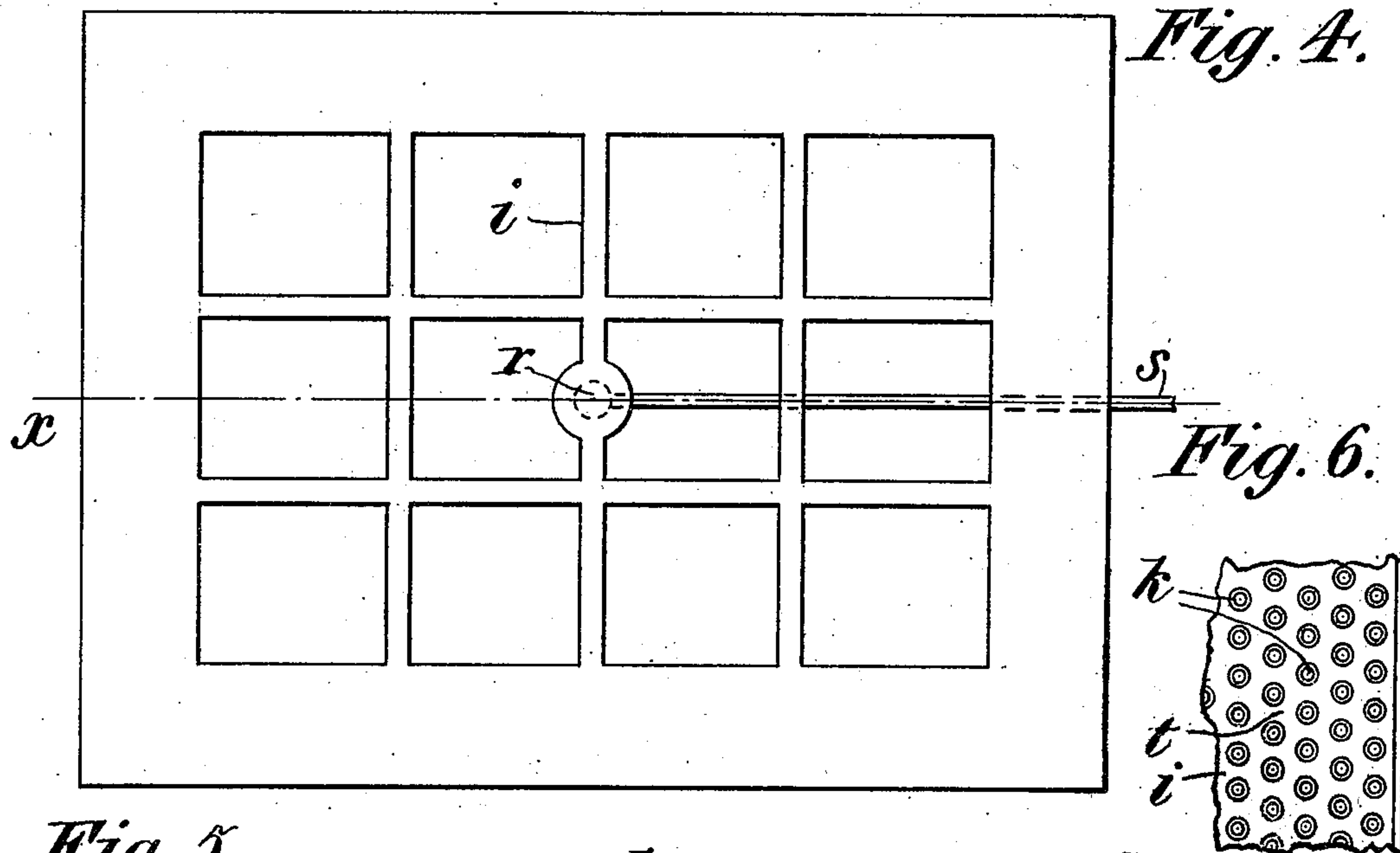
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Fig. 8.

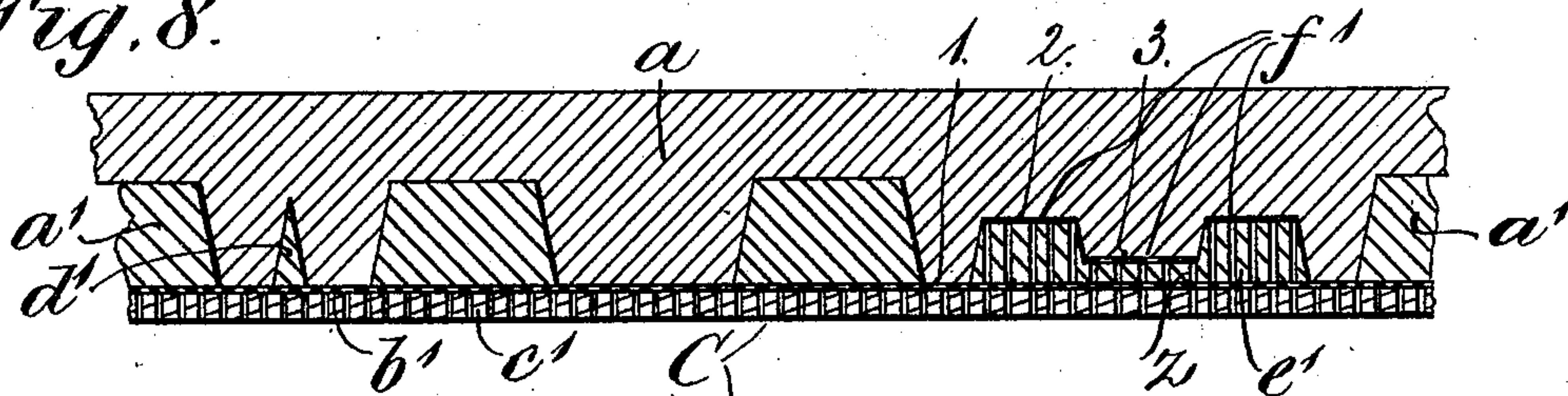


Fig. 9.

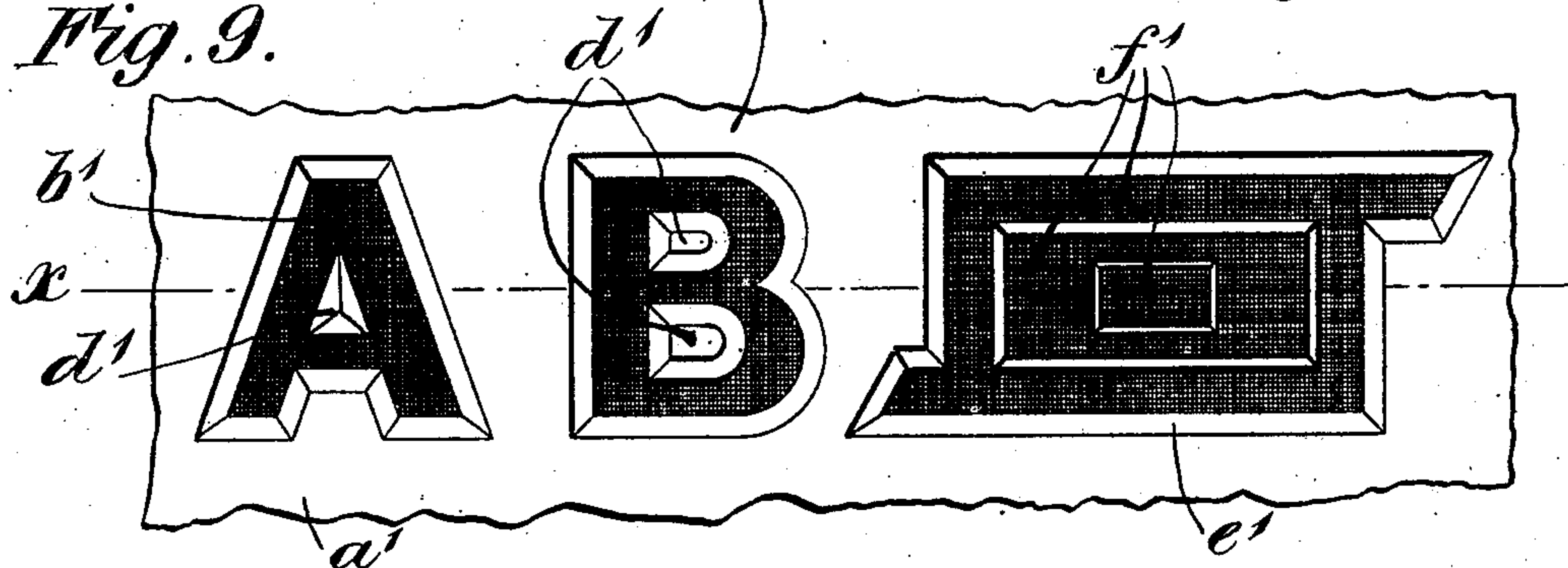
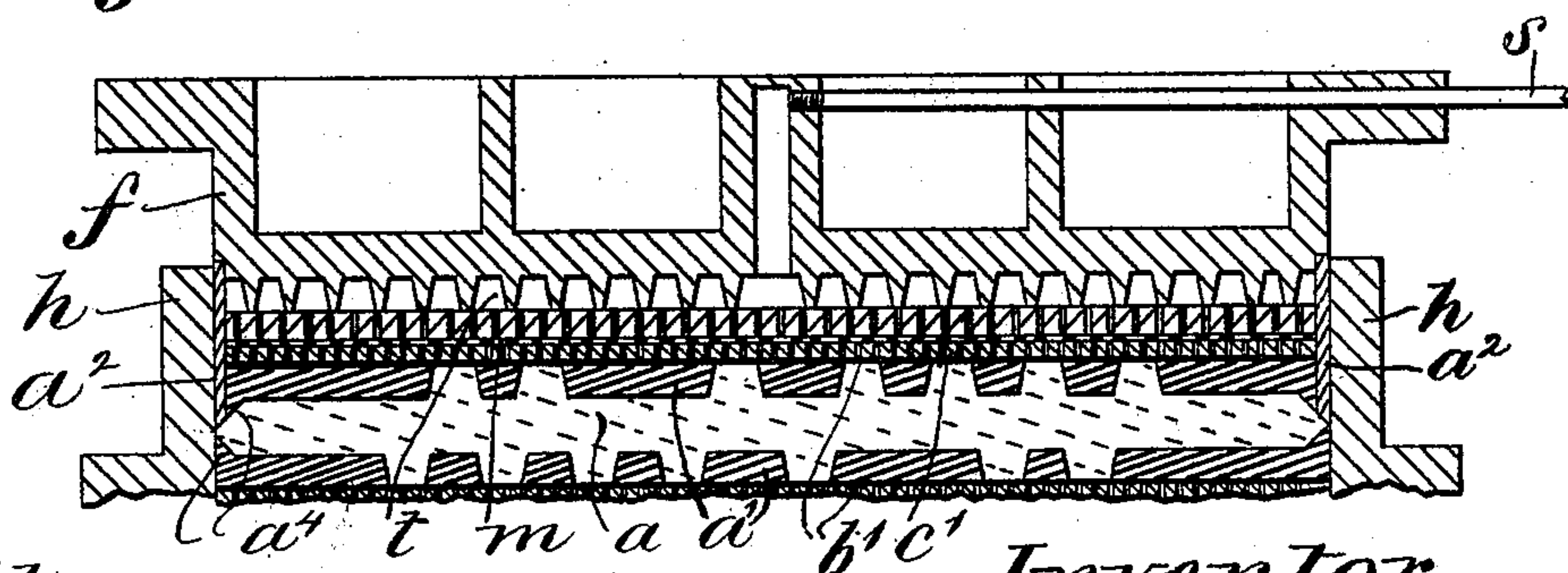


Fig. 10.



Witnesses.

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UNITED STATES PATENT OFFICE.

FRANK BENONA HOWARD, OF MONTREAL, CANADA.

MACHINE FOR COMPRESSING PULP.

SPECIFICATION forming part of Letters Patent No. 513,017, dated January 16, 1894.

Application filed February 18, 1889. Serial No. 300,343. (No model.)

To all whom it may concern:

Be it known that I, FRANK BENONA HOWARD, a citizen of the United States of America, residing at the city of Montreal, in the district of Montreal and Province of Quebec, Canada, have invented new and useful Improvements in Machines for Compressing Pulp; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to improvements in the apparatus by which pulp is pressed into shape for the purpose of forming it into slabs or masses having regular or irregular embossed surface or surfaces; and the object of my invention is to form a pattern or die plate in such a manner that the highest of the embossments formed by it will be equal to the thickness of the pattern or die plate and thus form openings through it and thus give a better drainage at these points, while for additional drainage at the lesser heights of embossments perforations in the pattern or die plate will be formed and these will be covered with wire cloth or pervious material.

In the accompanying drawings similar letters and figures of reference indicate like parts.

Figure 1, is a side elevation of portions of a press with mold or former arranged in connection therewith. Fig. 2, is a central longitudinal vertical section of the mold or former shown in Fig. 1, taken at about the line x , Fig. 4, with section of the pattern or die plate C, shown in connection therewith such section of the pattern or die plate being taken at the line x , Fig. 3. Fig. 3, is a plan view of a modification of the pattern or die plate C. Fig. 4, is a plan of the upper side of the upper portion f , of the mold or former detached. Fig. 5, is a plan of the lower portion h , of the mold or former placed upon the perforated bed g , also showing pattern or die plates (two) C in place within it and occupying a portion thereof. In the remaining portion of the mold or former, portions of the various parts underlying the plate a' , of the pattern or die plate C, are shown in plan view. Fig. 6, is a plan of the underside of a portion of the casing i , showing an inverted

plan view of the projections k . Fig. 7, is a section of a portion of the drainer-bed n , taken at line x , Fig. 5. Fig. 8, is a longitudinal section of a portion of a pattern or die plate for forming embossments at various heights; showing also the manner of forming drainage to the same, also showing the pulp a , as having been compressed therein; this section is taken at the line x , Fig. 9. Fig. 9, is a plan of the portion of the pattern or die plate shown in section in Fig. 8. Fig. 10, is a section taken at about line x , Fig. 4, similar to the section shown in Fig. 2, but in this case arranged with pattern or die plate or plates placed in the upper portion f , of the mold or former as well as in the lower portion h , so that embossed surfaces will be formed on both sides of the compressed pulp.

d , is the head of a press, in this case stationary, and e , is the platen of the press which is arranged to move up and down. If desired a vice versa arrangement of the two may be made.

To the head d , of the press is attached by bolts and nuts d^4 , the upper part f , of the mold or former. This as shown consists (see Figs. 1, 2, 4 and 6,) of a casing i , having conical projections k , on its under side. Each side of the casing i , is provided with a marginal edge or strip a^2 , which may either be made integral with the casing i , or attached thereto as desired. These are provided with bevel edges a^3 .

r , is a chamber formed in the casing i .

s , is a pipe connected with the chamber r , and with any suitable air-pump or other ordinary means attached to it, by which a vacuum may be formed in the space t , about the projections k , and in the chamber r .

l , is a perforated plate placed close up, under the projections k , and may be held in place by being fitted tightly within the marginal edges a^2 , or with solder, or in any ordinary manner.

m , is a wire cloth filter or pervious surface placed under the plate l , and attached thereto by soldering at the edges, or in any desired manner. The projections k , serve as distance-pieces to prevent the plate l , being pressed up to the body of the casing i , when

pulp is pressed in the former or mold or when there is a vacuum in the space *t*, or both.

On the platen *e*, is placed a drainer bed *n*. (See Figs. 2, 5, and 7.) This is provided with ribs *o*, and at one or both ends of the ribs, with a channel *p*, provided with one or more discharge pipes *q*.

g, is a perforated plate laid upon the ribs *o*, and upon this is laid the lower part *h*, of the mold or former. This is arranged to fit closely to the upper part *f*.

u, is a filter wire cloth forming a pervious surface placed within the lower part *h*, of the mold or former and upon this are placed the pattern or die plates *C*, which may be arranged with regard to size so that the lower part *h*, of the former or mold will hold one or more of them as desired.

The pattern or die plates *C*, each consists of a die plate *a'*, an exact matrix of the pattern or embossments to be formed on the mass of pulp pressed; it is in thickness equal to the height of the highest relief or embossments formed on the pulp, so that in the places in which these occur openings are formed completely through the plate *a'*; the bottoms of these openings being formed by a fine filter wire cloth *b'*, and perforated plate *c'* which are made (in plan) the same size as the plate *a'*, and attached thereto by soldering at the edges or in any ordinary manner.

The plate *a'*, is provided with beveled edges *a⁴*. These are set out with a suitable calking tool against the walls of the lower part *h*, of the mold or former and against the sides of each other, when more than one pattern or die plate *C*, are placed together in the lower part *h*, of the mold or former. This is done to prevent the pulp from escaping at these places.

Should it be desired to form embossments on both sides of the compressed pulp, the apparatus will be arranged as shown in Fig. 10, which is the same as Fig. 2, only that in this case the marginal edges *a²*, are made of greater depth or width, sufficiently so, that a pattern or die plate (or plates) similar to those in the lower part *h*, may be placed in the upper part *f*, also under the perforated plate *l*, and filter wire cloth or pervious surface *m*.

Whenever the pattern or letters, &c., to be formed on the pulp, are such that a central or detached portion *d'*, of the plate *a'*, (see Figs. 8 and 9) will be required to be formed; or as in the letters *P*, in the word "pulp," (in Fig. 3) such portion will be attached on the wire cloth or pervious surface *b'*, by solder or in any other desired manner, and thus held in the proper relative position with regard to the other parts of the letter or pattern.

When the pattern or embossments to be formed on the pulp are such that several heights of relief are required, as shown at 1,

2, and 3, in Fig. 8, only the highest as at 1, will form openings in the plate *a'*.

To prevent water from the pulp lodging in the recesses formed by the various heights of relief as at 2, and 3, the portion *e'*, of the plate *a'*, is provided with perforations *Z*. The perforations at the height of relief 2, are not absolutely necessary but I prefer to provide them to give greater freedom of drainage. The perforations at the heights of 3, are necessary because by the relative position and heights of the relief at 2, and 3 a recess is formed. The various heights of relief will be covered as shown with wire *f'*, forming pervious surfaces at such places.

From the above it will be seen that when the pattern or die plates *C*, are made for imparting to the pulp only one height of relief or embossments, the plate *a'*, is made solid throughout except where the openings are caused for the said embossments, and that the wire cloth *b'*, must necessarily be present and be firmly attached to the plate *a'*, for the purpose of having a proper body of material to attach the center or detached portions *d'*, of the plate *a'*, to, and hold them in their proper places. The perforated plate *c'*, forms a clamp to clamp the wire cloth *b'*, between it and the plate *a'* and to protect it from displacement by any strain to which it might be subjected when the pattern or die plates are being placed, adjusted and secured in the mold or former. Also that whereas the perforations in the drainer plate *g*, are large, and if the wire cloth *b'*, were laid immediately upon it the force with which the pulp is pressed would cause the wire cloth to sag into them. To prevent this the thin finely perforated plate *c'*, is also used. Again to prevent any obstruction of the drainage by reason of the perforations in the perforated plate *c'*, not agreeing with the perforation in the drainer plate or bed *g*, the coarse wire cloth *u*, is interposed between them.

What I claim is as follows:

1. In a machine for molding pulp articles with embossed surfaces, the combination of a mold or former, having a pervious surface; and a pattern or die plate fitted to and supported on said mold or former, said pattern plate having open spaces corresponding with the raised portions of the design substantially as described.

2. In a machine for molding pulp articles with embossed surfaces, the combination of a mold or former, having top and bottom pervious surfaces, with a pattern or die plate, composed of a plate *a'*, having the matrix of the pattern or embossment to be formed on the pulp, formed therein, the highest of said embossments forming openings through the plate *a'*, and a wire cloth or pervious surface *b'*, attached to the plate *a'*, and having the center or detached portions *d'*, of the plate *a'*, attached to the said wire cloth *b'*,

with plate c' , attached to both plate a' , and wire cloth b' , the whole substantially as described.

3. In a machine for molding pulp articles
5 with embossed surfaces, the combination of a mold or former having pervious surfaces, a pattern or die plate having openings corresponding with the highest embossments of

the design or pattern, and provided with perforations Z , and wire cloth f' , at less elevated portions of the design or pattern the whole substantially as described.

FRANK BENONA HOWARD.

Witnesses:

CHARLES G. C. SIMPSON,
H. DURIER.