

No. 745.869.

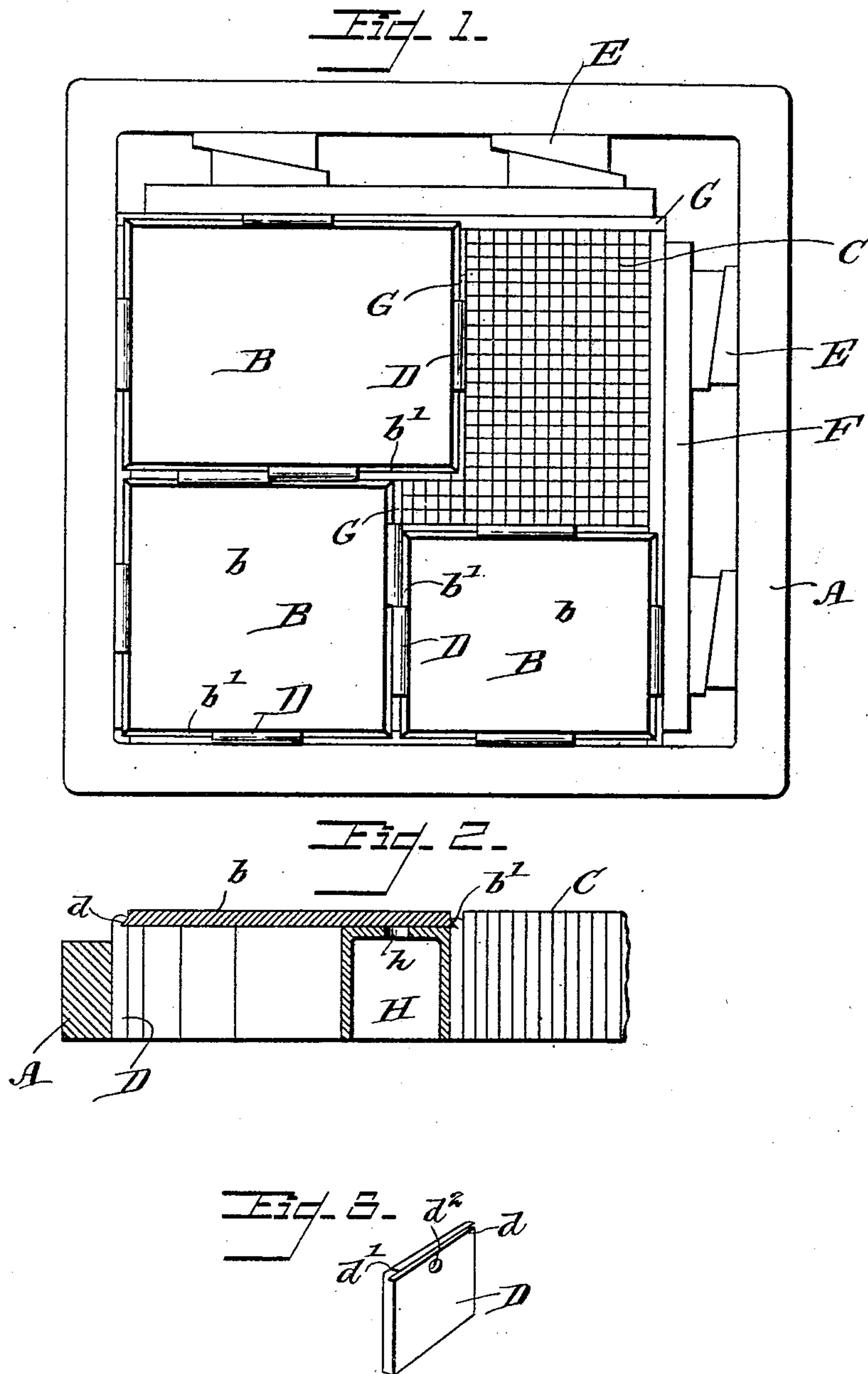
PATENTED DEC. 1, 1903.

F. C. LEETHEM.
PRINTER'S FORM.

APPLICATION FILED AUG. 22, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

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2 SHEETS—SHEET 2.

Fig. 4.

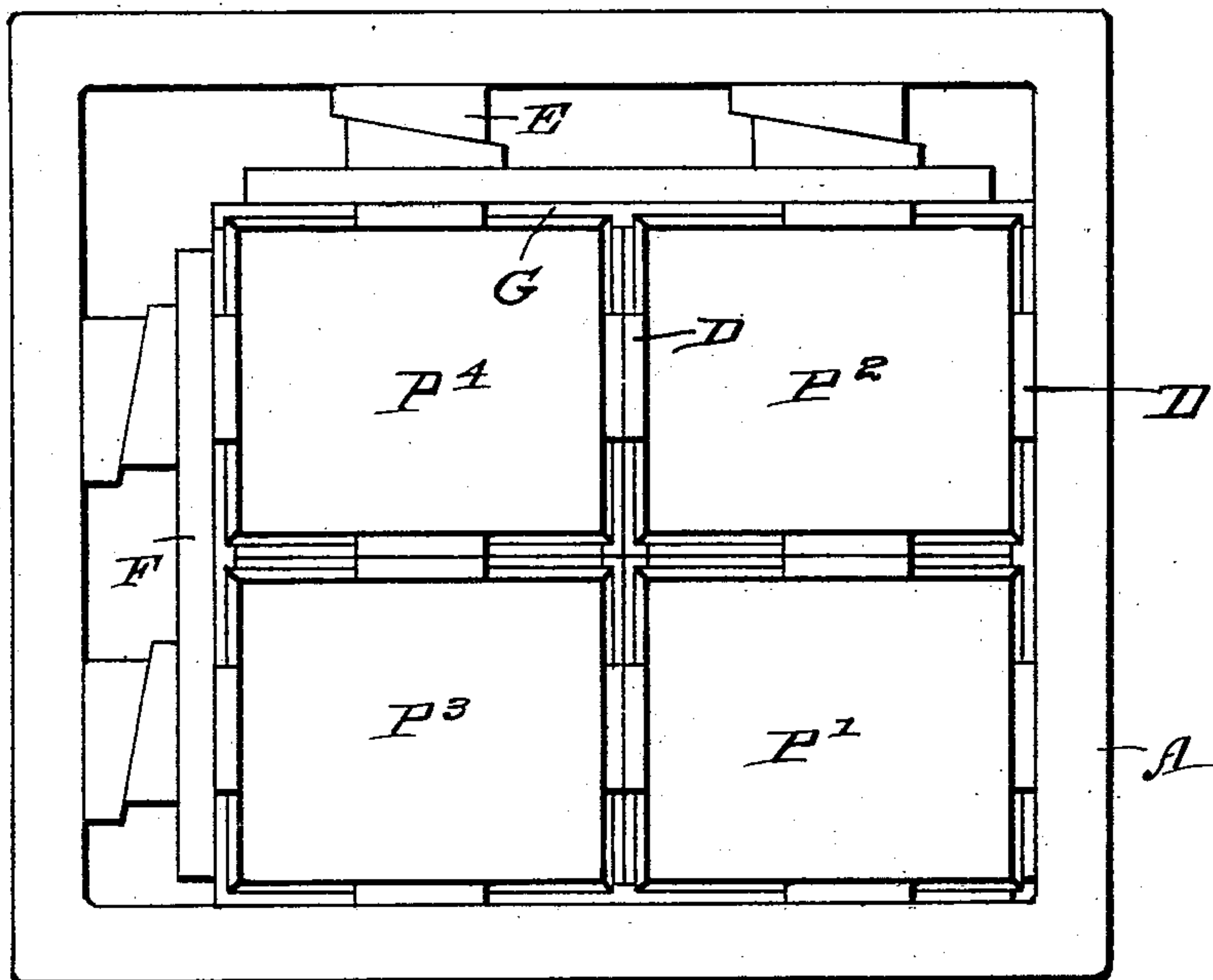
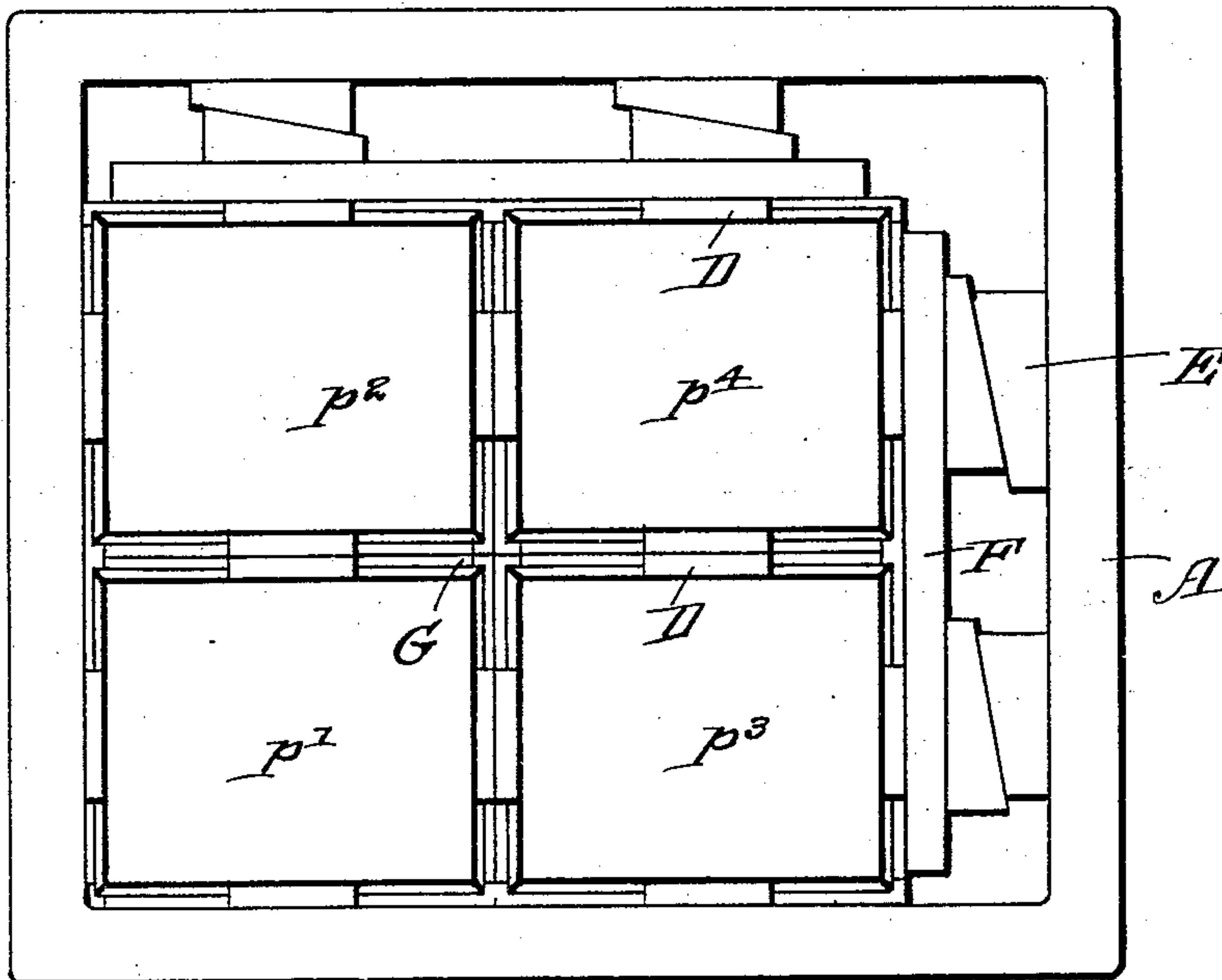


Fig. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

FRANK C. LEETHEM, OF CLEVELAND, OHIO, ASSIGNOR TO LOUISE AMELIA LEETHEM, OF CLEVELAND, OHIO.

PRINTER'S FORM.

SPECIFICATION forming part of Letters Patent No. 745,869, dated December 1, 1903.

Application filed August 22, 1901. Serial No. 72,906. (No model.)

To all whom it may concern:

Be it known that I, FRANK C. LEETHEM, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Printers' Forms, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to printing and concerns itself especially with the structure of what is known in this art as the "printing-form."

Before proceeding to a detailed description of my invention it should be said that in printing books or folders when electrotypes or printing-plates are used each plate usually constitutes the matter of one complete page, and these plates are arranged together in a form. The form is then printed from upon a large sheet of paper, which paper is then folded, so that its printed portions will follow each other as pages in regular order, as intended in the finished work. Before this folding takes place, however, the paper is printed on both sides, as stated, and it is most desirable that the printed matter on opposite sides of the same leaf should be in juxtaposition or in what is known as "register," so that if any leaf were viewed against the light the outline of the printed matter upon its opposite sides would be identical. When this is the case, the pages are said to be in "perfect" register. This particular kind of register is termed "back-to-back" register. The desirability of registering the printing-plates in this manner has occasioned the use of adjustable devices for holding the plates in the form, capable of a slight movement, sufficient, however, to bring the plate into its proper position. Adjusting each plate individually in this manner consumes a great amount of time and necessitates a loss to the trade simply from this reason without regarding the additional cost of such adjustable devices, and, too, where a printed page comprises several colors, necessitating the use of as many plates as there are colors, the plates must be absolutely in register or the symmetry of the resulting colored print is hopelessly lost.

It is the object of this invention to produce

a form the composition of which is entirely independent of the unsatisfactory adjustable devices and, further, to construct or build up this form in such a manner as to maintain a definite relation between the respective positions of the printing-plates. The accomplishment of these ends enables that still more desirable object to be attained—namely, perfect register.

The invention consists in the means whereby these ends are accomplished, all of which will be more fully described hereinafter and definitely set forth in the claims.

In the drawings, Figure 1 represents a form made up ready for printing. Fig. 2 represents this form in section. Fig. 3 represents one of my retaining-hooks in perspective. Figs. 4 and 5 represent, respectively, two forms made up according to my invention.

Referring to the parts by letters, A represents a chase, which may be of the usual construction.

B B represent electrotypes or other printing-plates adapted to be used in connection with my invention. As indicated clearly in Fig. 2, each of these plates has a printing-face *b*, and each is provided also with a beveled margin *b'*. This beveled margin is preferably cut at a forty-five degree angle and extends continuously about the plate. It projects beyond the edge of the printing-face *b* an amount which is a multiple or an aliquot division of a unit of some type-measuring system. I prefer to make this amount a half-pica and use the pica system. The printing-plates are previously cut so that their length and breadth are commensurable in units of this same type-measuring system, or picas. Behind the plate are placed blocks or backs H, which are also of dimensions commensurable in the units of this same type-measuring system, and I make these of different sizes—namely, eight by eight, four by eight, and one by eight—so that they are adapted to be combined to form a continuous and complete back for any plate commensurable in picas, as shown in Fig. 2, and the edges of this built-up back will then aline with the edges of the printing-face *b*. These plates and hooks are intended to be assembled in a form, as shown in Fig. 1, using generally four hooks for each

plate, but more may be used if found necessary. The spaces around the backing behind the plates may be filled by pica slugs G of the proper length, which will lie between the
 5 hooks and beneath the projecting margins b' , as will be readily understood, and it will be observed that the width of these spaces will always be at least one and one-half picas. In case it is made up of a half-pica in this way a
 10 half-pica slug must of course be inserted also to make up the difference.

The form will be built up as usual from one corner, as indicated in Fig. 1, and to illustrate how my invention is adapted to make
 15 these electrotypes set up beside ordinary type such type are represented at C at the right. It will be observed that since the plates are all of a width commensurable in even picas, even where plates of widely-different dimen-
 20 sions are set up together, as shown in Fig. 1, the space around them can be filled by pica type or type cut to the point system, so that they will justify perfectly with the plates, as indicated.

25 The outer side of the body of type may be retained by a pica rule or long pica slugs, and outside of this the usual furniture F may be provided and the whole form clamped up in the usual manner by the quoins E.

30 From the arrangement described it will be observed that plates of any dimensions commensurable in units of the type system used can be readily set up, so that the retaining-hooks will justify with the backs or blocks
 35 behind. At the same time the plates themselves are justified by means of the notches d and retained in place. No adjustments are necessary. When the hook fits the back, it fits the printing-plates. The advantages of
 40 this method are very apparent and much appreciated where it is desired to make colored prints, for since the adjustable hooks are dispensed with a plate to print a different color can be quickly set up in the form, and when
 45 blocked up and clamped its printing-face cannot fail to be in the proper position or register. This will appear more fully hereinafter.

It should appear from the foregoing that in each electroplate the length and breadth
 50 over all are multiples of the unit of a type-measuring system. Furthermore, as the margin is a half-pica wide and the hook a pica thick each hook projects beyond the plate a half-pica. Hence when placed in the form the
 55 dimensions over the outside of the hooks are likewise commensurable in the units of the system used.

I may use the "point" system, in which case I would retain the same actual sizes for
 60 the margin and the hook, and their dimensions could then be expressed as multiples of the unit and perfect register could be obtained as before.

The blocks H, one of which is shown in
 65 section in Fig. 2, are made hollow, as indicated, and are each provided with an opening h in their upper face to facilitate their

removal. The hooks are similarly provided with an opening d^2 for the same purpose.

To illustrate how my invention enables perfect back-to-back register to be obtained, I shall refer now to Figs. 4 and 5, showing two
 70 forms. P' , P^2 , P^3 , and P^4 represent, respectively, the printing-plates shown in Fig. 4. p' , p^2 , p^3 , and p^4 represent the plates of Fig. 5, 75 the plates of the one form being intended to print upon the opposite side of the leaves printed by the corresponding plates in the other form, as will be readily understood. Thus P' is to "back" on p' , P^2 on p^2 , &c. It 80 is of course easy to arrange plates so that they will be nearly in register back to back; but plates set up in the form as these plates are will come exactly back to back, and so far from encountering any difficulty it is hardly 85 an exaggeration to say that they register themselves automatically.

Before the printing-plates are received by the printer they are trimmed upon a machine also of my invention and forming the sub- 90 ject-matter of a separate application, said application having been filed August 30, 1901, and bearing the Serial No. 73,832. For our present purposes, however, it is only necessary to say that this machine not only cuts 95 the printing-plates to definite dimensions, but it "centers" the printing matter of each plate, so that it bears the same relation to its margin after trimming, as does the printing matter of any other plate of the same kind 100 and cut to the same size. This means that if two of the plates printed successively upon the same sheet of paper with their margins occupying precisely the same position their type-lines would also occupy precisely the 105 same positions and would aline throughout. These systematically-trimmed plates are systematically arranged in the forms, the two forms being made identical throughout in their make-up. The method shown in con- 110 nection with these two latter figures is somewhat of a modification of that shown in connection with Figs. 1 and 2. Here the hooks D, where they occur between the plates, are set back to back, as indicated. The particu- 115 lar arrangement adopted is of course immaterial so long as it is the same for both the forms. The forms should evidently be made up as right and left, respectively, as shown, so that if one form were inverted and laid 120 upon the other each of its plates would fall upon the corresponding plate of the other. Furthermore, the edges of the printing-plates will coincide or register each to each, since they are at the same distance from the sides 125 of the chase, and the printing matter of the plates will also aline, since the plates have been trimmed alike.

What I claim is—

1. In a printer's form, in combination, a 130 chase, printing-plates, retaining-hooks therefor, between said chase and said printing-plates, said hooks being commensurable in a type-measuring system, whereby the distance

from said chase to said printing-plates is commensurable in the same system.

2. In a printer's form, in combination, printing-plates, hooks adapted to retain the same, a backing for said plates, a chase, said plates, said hooks and said backing being commensurable in the same measuring system, whereby the distance of said plates from two sides of said chase is commensurable in the said measuring system.

3. A printer's form comprising a plurality of printing-plates, hooks adapted to retain the same, said hooks and said plates being commensurable in the unit of the same type-measuring system, and the printing matter of said plates being centrally located upon the same.

4. A printer's form comprising a plurality of printing-plates having beveled margins, undercut hooks adapted to engage therewith, a backing for said plates, all of said parts being commensurable in the same type-measuring system, and the printing matter upon each of said plates being centrally located with respect to the margins thereof.

5. A pair of printing-forms comprising printing-plates adapted to print upon opposite sides of the same sheet and slugs arranged around said plates, corresponding plates being similarly arranged, whereby they will register, said slugs being commensurable in the type-measuring system.

6. As a new article of manufacture, a printing-plate hook having a notch upon the inner face thereof to receive the margin of a printing-plate, said hook being of a thickness commensurable in a unit of a type-measuring system.

7. As a new article of manufacture, a hook adapted to retain a printing-plate, said hook being adapted to project laterally beyond the margin thereof, an amount commensurable in units of a type-measuring system.

8. As a new article of manufacture, a printer's retaining-hook having a notch, the depth of said notch and the thickness of said hook being commensurable in units of a type-measuring system.

9. In a printing-form, in combination a printing-plate having beveled edges, and hooks having notches adapted to engage therewith, the dimensions of said plates over said beveled edges being commensurable in units of a type-measuring system, said hooks projecting laterally beyond said beveled edges, an amount commensurable in the said units of a type-measuring system.

10. In a printing-form, in combination, a printing-plate having beveled margins, and hooks adapted to engage therewith, the width of said margins being commensurable in units of a type-measuring system, and the width of said hooks being commensurable in the units of said type-measuring system.

11. In a printing-form, in combination, a printing-plate having beveled margins, and hooks adapted to engage therewith, the width of said plate over said margins being commensurable in units of a type-measuring system, said hooks projecting beyond and beneath said plate, amounts which are commensurable in the units of said type-measuring system.

12. In a printing-form, in combination, a printing-plate, a backing therefor, which is commensurable in units of a type-measuring system, the distance of the margins of said plate from the sides of said backing being commensurable in units of a type-measuring system.

13. In a printing-form, in combination, a printing-plate the lateral dimensions whereof are commensurable in units of a type-measuring system, a backing for said plate, the dimensions whereof are also commensurable in units of said type-measuring system, the distance from the margins of said plate to the sides of said backing being also commensurable in the units of the same type-measuring system.

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

FRANK C. LEETHEM.

Witnesses:

ELLA L. PARDEE,
F. D. AMMEN.