

No. 631,062.

Patented Aug. 15, 1899.

P. F. COX.  
MULTISPACE.

(Application filed Sept. 14, 1898.)

(No Model.)

Fig. 1.

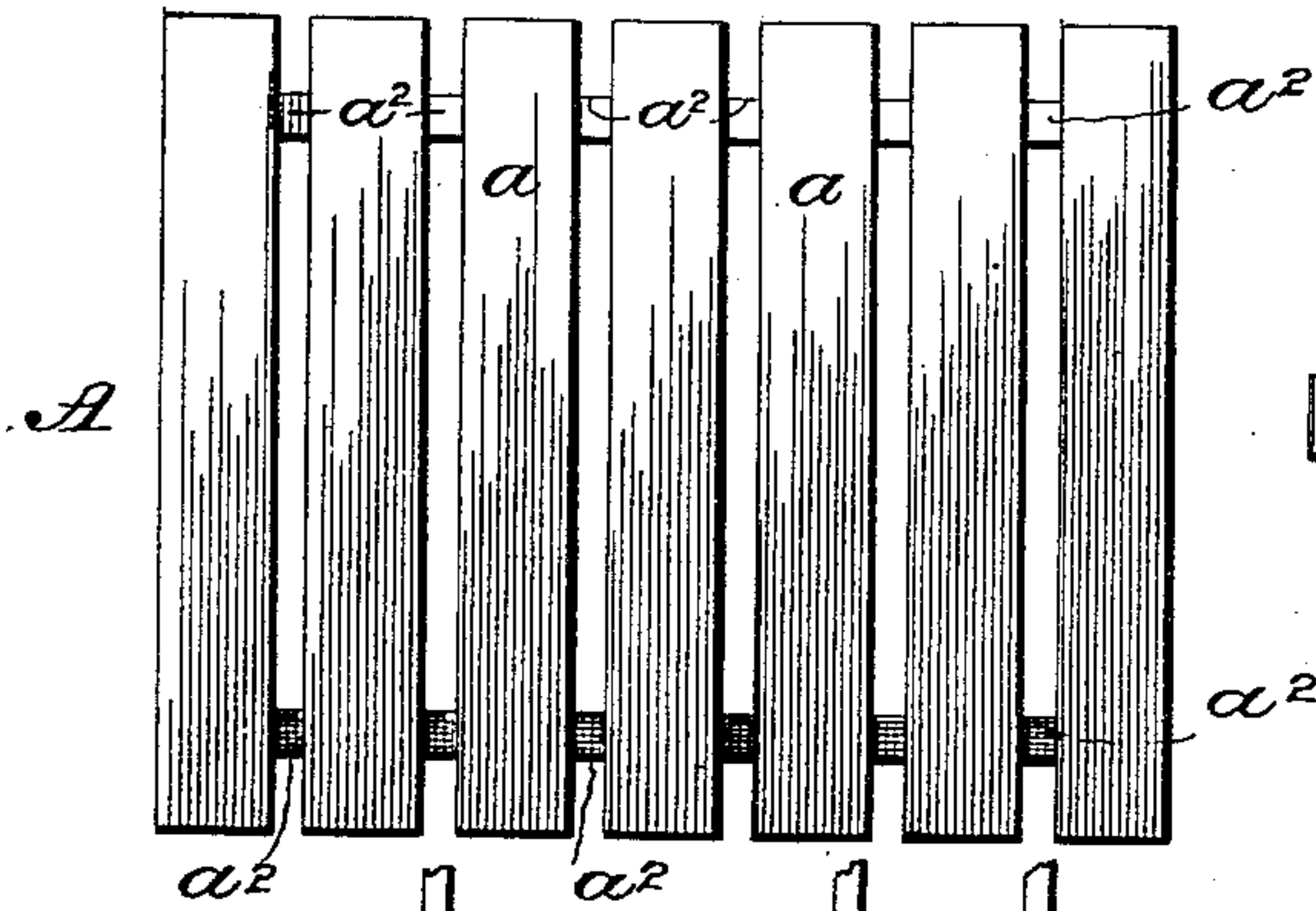


Fig. 2.

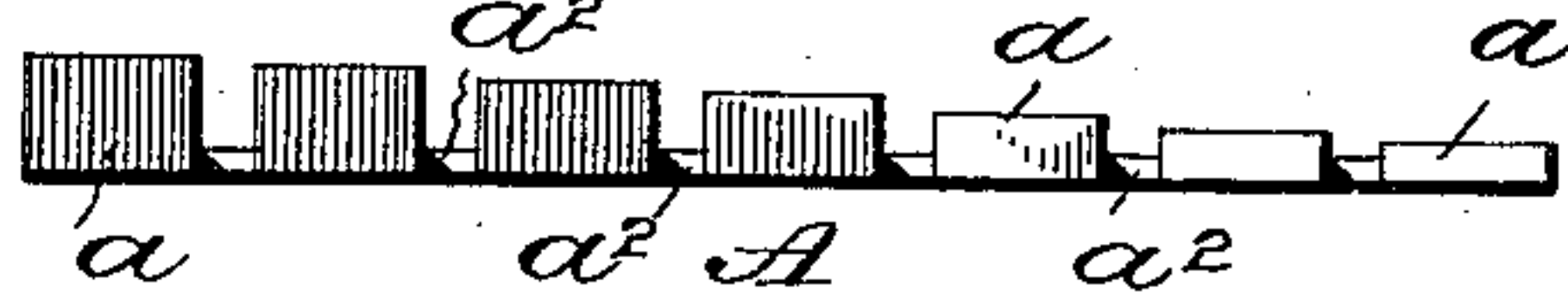


Fig. 3.

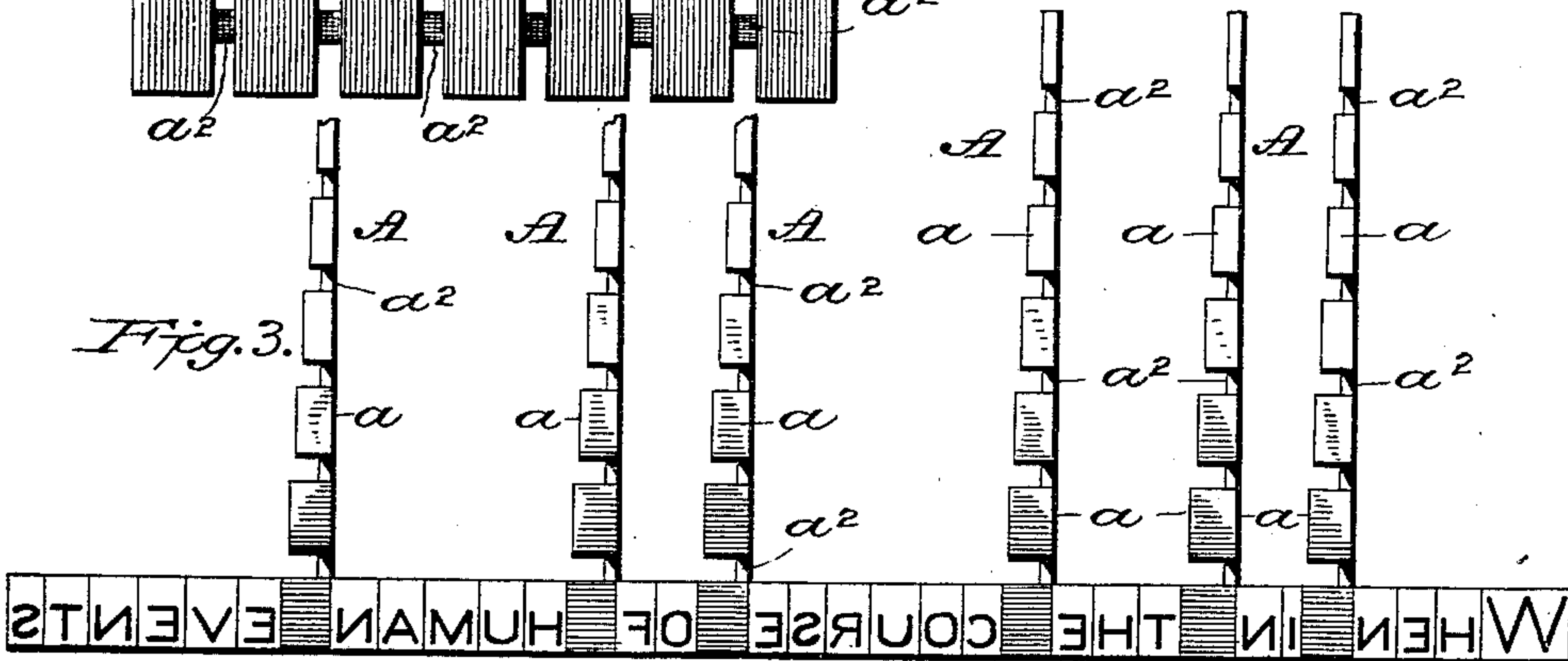


Fig. 4.

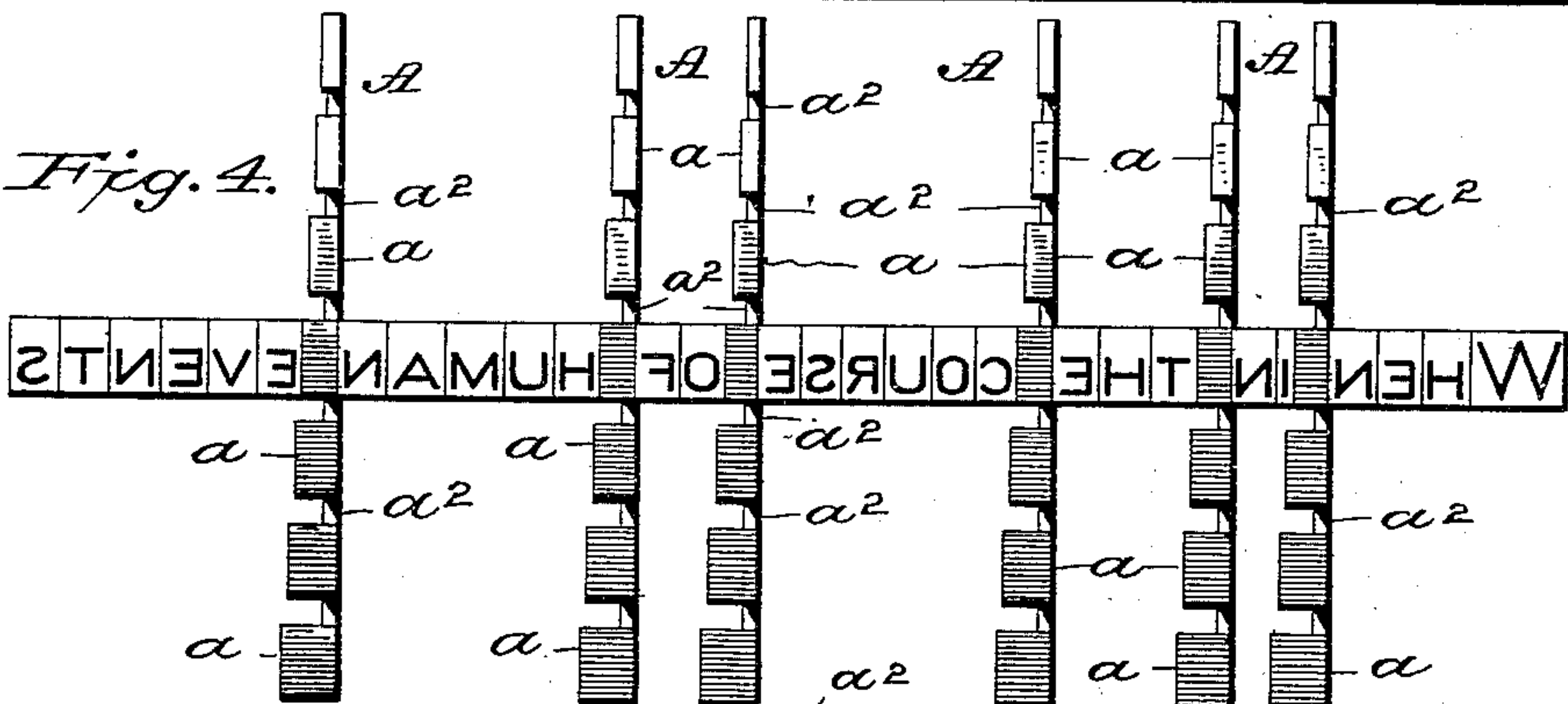
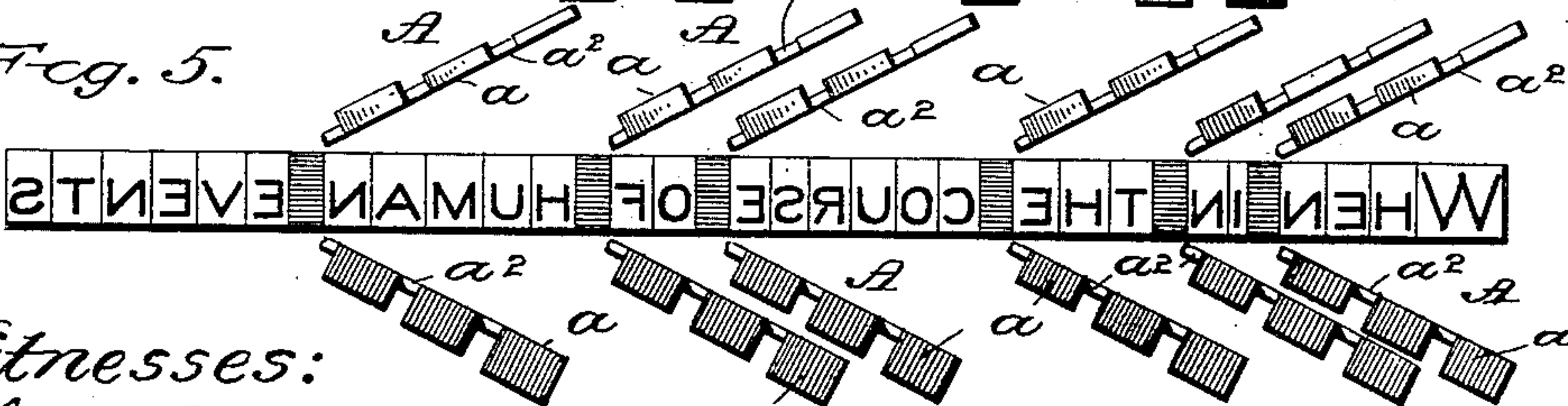


Fig. 5.



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## MULTISPACE.

SPECIFICATION forming part of Letters Patent No. 631,062, dated August 15, 1899.

Application filed September 14, 1898. Serial No. 690,963. (No model.)

*To all whom it may concern:*

Be it known that I, PAUL FLEMMING COX, of Hartford, in the county of Hartford and State of Connecticut, have invented certain  
5 new and useful Improvements in Multispaces; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

10 This invention is an improvement in machine type-setting; and it consists in a novel method of justifying composed lines of type and in a novel multispace for use in such method.

15 The improved multispace consists of a series of separable spaces ranging from the thickness of an "em-space" to that of a "hair-space" arranged parallel edge to edge, the hair-space being at one end and the em-space  
20 at the other end, the intermediate spaces being arranged successively between the two according to their width, and adjoining spaces being connected at their adjacent edges.

In my new method of justifying these multispaces or their equivalents are inserted in the  
25 lines of type during the composition thereof, preferably with the thick end or em-space in position between the words, so that the lines when composed will be overset. Then to  
30 justify the line to the proper length one or more of the multispaces are successively or simultaneously displaced in the line, so that the narrower parts thereof will be brought into the line until it is of the proper length.

35 Thereafter the projecting spaces on each side of the line of type are broken off, leaving the lines of type properly justified. The method may also be employed to justify underset lines by composing the type with the thin  
40 parts of the spaces in position and after the line is composed shifting the multispaces from thin to thick, successively or simultaneously, until the line is properly justified and then breaking off the lines, as before. I prefer to  
45 justify by oversetting the line, as first stated.

I do not propose in this application to describe the mechanism for utilizing the multispaces and carrying out my method, as it is  
50 not necessary to do so, and when the invention is understood various mechanisms can

be readily devised or adapted to utilize the same.

The invention which I desire to protect by the present application is summarized in the claims following the description, and the ac-  
55 companying drawings illustrate the construction of the multispace and also the method of utilizing the same in justifying an overset line.

Referring to said drawings, Figure 1 is an  
60 enlarged face view of a multispace. Fig. 2 is an enlarged edge view thereof. Fig. 3 is a view of an overset line of type with multispaces in position as composed therein. Fig. 4 is a view of the same line of type after the  
65 multispaces have been adjusted to justify it. Fig. 5 is a similar view of the justified line of type with the surplus or projecting portions of the multispaces broken away.

As shown in the drawings, the multispace  
70 A is composed of a number of ordinary spaces  $a$  of varying sizes arranged parallel, edge to edge, with the thickest space at one end and the thinnest at the other, the intermediate spaces being arranged according to their  
75 thickness between the end spaces. These spaces are separably united by thin integral intermediate connections or bonds  $a^2$ , so that any space may be easily broken apart from  
80 the others, if desired.

The multispace roughly resembles a thin wedge composed of a series of parallel sections of equal length and width and of different thicknesses.

These multispaces are inserted in the line of  
85 type during the composition thereof like the ordinary spaces, preferably with the thickest section  $a$  between the words, as indicated in Fig. 3, thus producing an overset line. Then  
90 in order to properly justify such overset line one or more of the multispaces therein may be successively or simultaneously shifted transversely of the line, so as to remove thicker  
95 portions from the line and bring in thinner portions, until the length of the line is properly reduced to the desired extent.

As above stated, in composing and justifying an underset line the multispaces would be assembled therein with their thinnest  
100 portions in the line and the line would be justi-



fied by shifting the spaces laterally, as desired, from thick to thin portions until the line was elongated to the proper extent. In justifying the lines by my method it might  
 5 be that different thicknesses of different multispaces would be left between different words if the multispaces were not all shifted alike. As indicated in Fig. 4, when the line is properly justified portions of the multispaces may  
 10 project on each side thereof. These projecting portions are afterward broken off, as indicated in Fig. 5, leaving the line of type properly justified, just as if spaces of correct width had been originally or afterward inserted in  
 15 the line by hand.

The multispaces can be composed in the line by suitable mechanism, which it is not necessary here to describe, and after the line is composed the multispaces are adjusted, as  
 20 described, one by one or in unison, simultaneously or successively, as the case may be, until the line is brought to the proper length. It may also happen that eventually different size spaces may separate different words; but  
 25 this can be regulated by the mechanism for controlling the spaces. After the line is justified the portion of the spaces that is broken off the opposite sides of the line can be carried to a melting-pot, and the multispaces can  
 30 be supplied from a suitable reservoir, which can be filled by a casting mechanism connected with the machine, if desired.

Having thus described my invention, what I therefore claim as new, and desire to secure  
 35 by Letters Patent thereon, is—

1. The herein-described method of justifying type-lines, consisting in composing the same with wide spaces between the words, adjusting these spaces laterally of the line until  
 40 it is properly justified, and finally removing all portions of the spaces projecting from the line, for the purpose and substantially as described.

2. The herein-described method of justifying  
 45 ing type, consisting in composing the same

with wide-stepped spaces, adjusting said spaces transversely of the line until it is of the proper length and then breaking off or removing the portions of said spaces projecting laterally from the line, for the purpose and substantially as described. 50

3. The herein-described method of justifying type, consisting in first composing a line of type with wide tapered or stepped spaces therein adjusted so as to cause the overset of  
 55 the line; second, adjusting said spaces in the line, by moving them transversely thereof, so as to shift the portions in the line from thick to thin until the line is of the proper length; and third, removing the projecting portions of  
 60 the stepped space from the line, for the purpose and substantially as described.

4. The herein-described multispace, composed of a series of connected but separable sections of relatively different thicknesses,  
 65 substantially as described.

5. A multispace composed of a series of rigidly-connected but separable sections of successively different thicknesses arranged edge to edge, the adjoining sections being united  
 70 at their edges by breakable connections, for the purpose and substantially as described.

6. The herein-described multispace for type justification consisting of a series of individual spaces of successively different thicknesses, arranged edge to edge and parallel to  
 75 each other, the adjoining spaces being connected at their edges by teats to permit the easy breaking away of those spaces which project beyond the line of type wherein the multispace is composed, for the purpose and substantially as described. 80

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

PAUL FLEMMING COX.

In presence of—

JAS. H. TALLMAN,  
 WILLIAM L. LINKE.