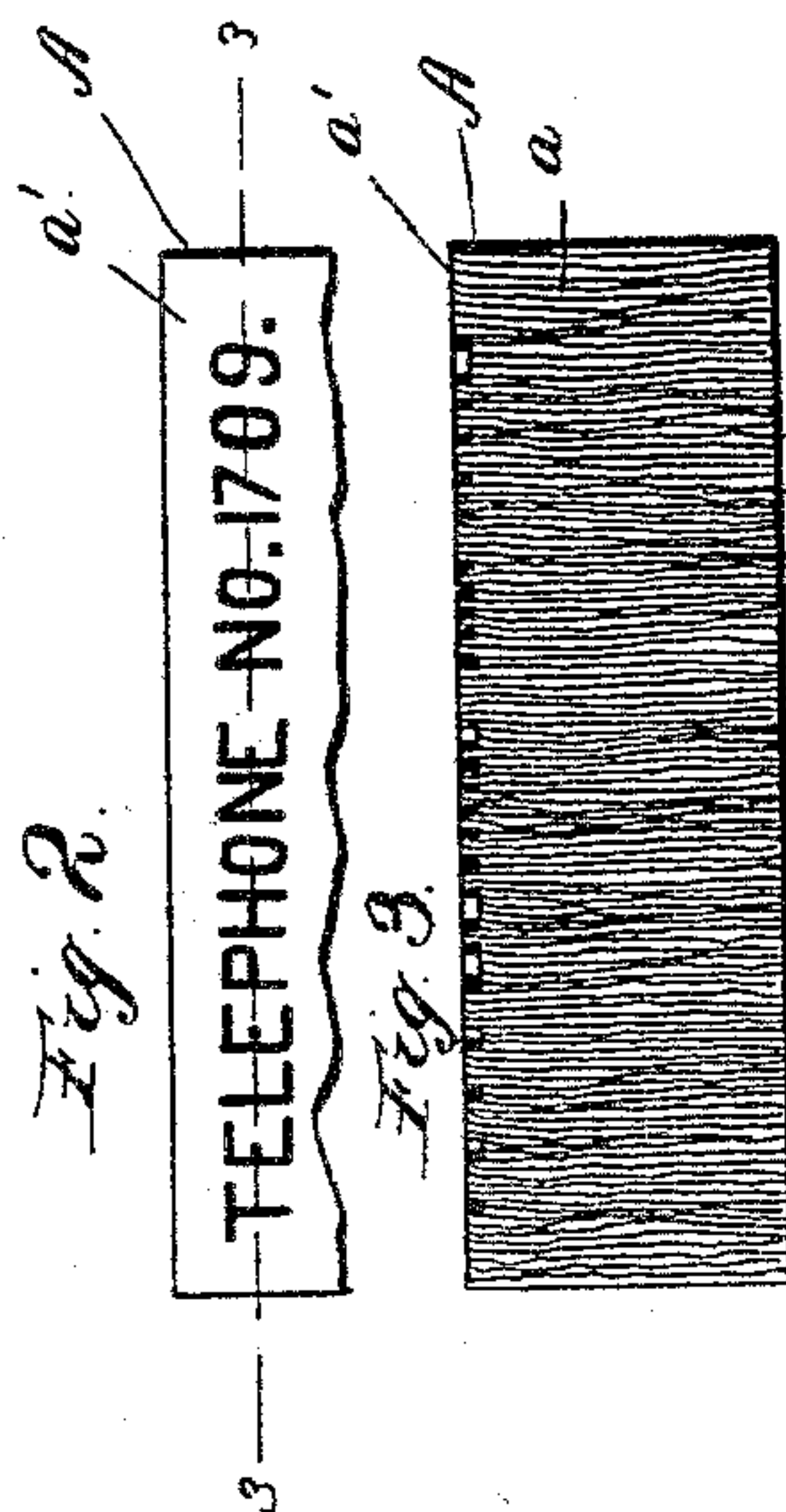
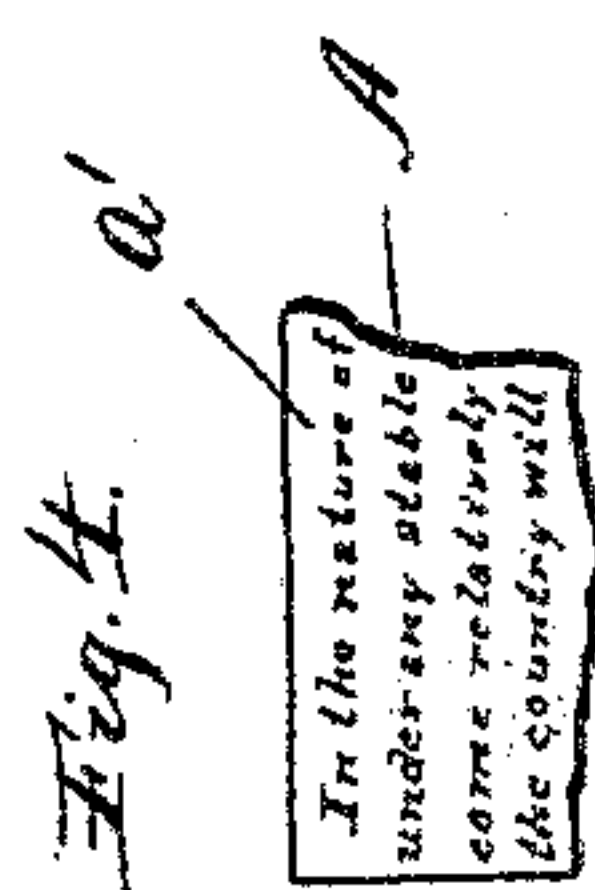
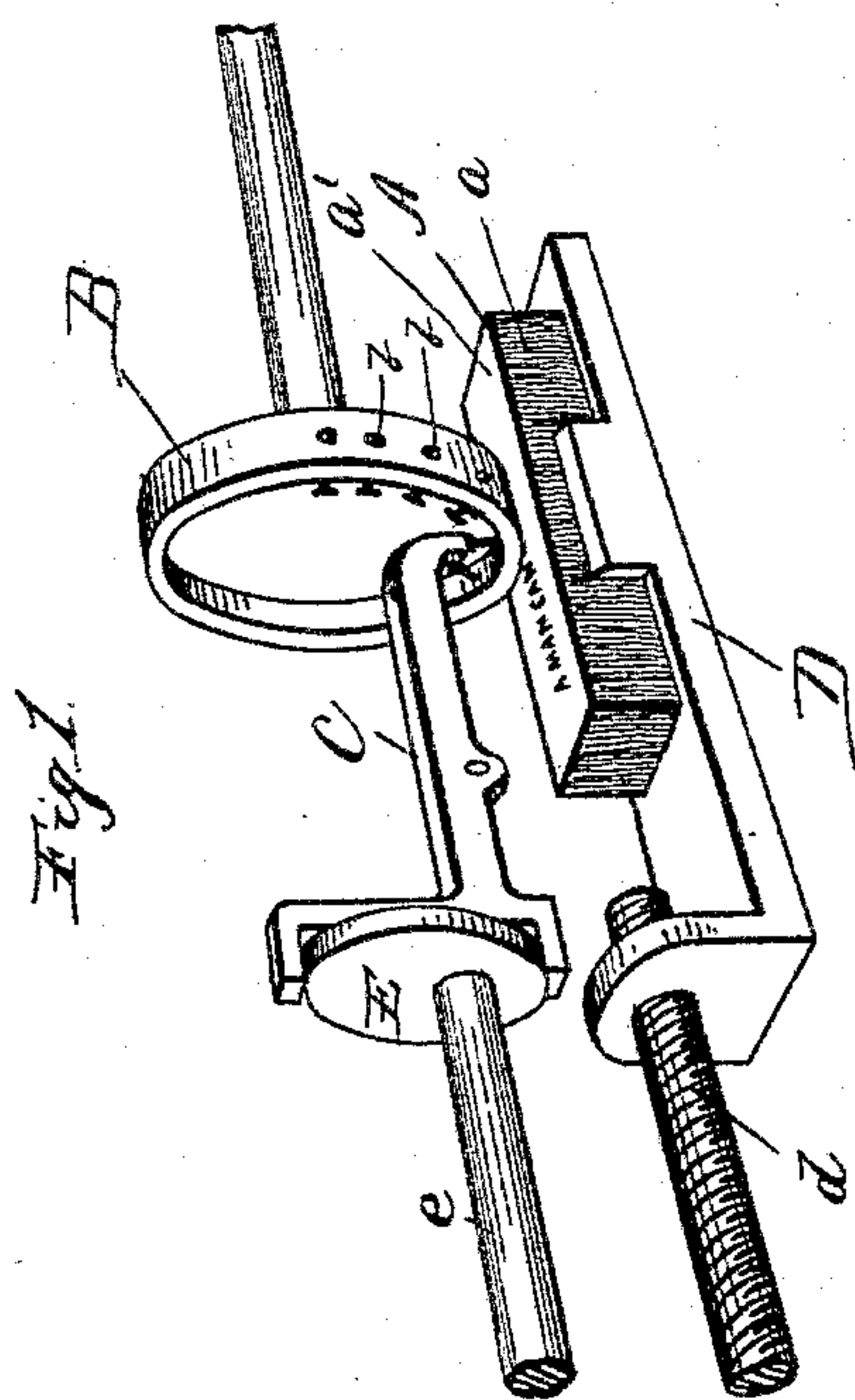


(No Model.)

C. SEARS.  
MAKING STEREOTYPE MOLDS.

No. 412,299.

Patented Oct. 8, 1889.



Witnesses:

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# UNITED STATES PATENT OFFICE.

CHARLES SEARS, OF CHICAGO, ILLINOIS.

## MAKING STEREOTYPE-MOLDS.

SPECIFICATION forming part of Letters Patent No. 412,299, dated October 8, 1889.

Application filed July 5, 1888. Serial No. 279,041. (No model.)

### *To all whom it may concern:*

Be it known that I, CHARLES SEARS, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in the Art of Making Stereotype-Molds, of which the following is a specification.

The method of making stereotype-molds now generally in use consists, briefly, in first setting up the type by hand and locking the same in a suitable form and then taking the impression from the type-form in wax, papier-maché, soft metal, or other suitable material, the wax, papier-maché, or other stereotype-mold being made from the whole form at a single impression. Attempts have also been made to construct and use machines for making stereotype-molds which operate to first set up and lock together a single line of type and then take the impression in wax from such line of type, thus forming the stereotype-mold line by line. This method, however, is open to serious objections, owing largely to the fact that it is necessary to employ a large number of type of each letter or kind, as frequently the same letter will occur many times in setting up a single line. Other difficulties arise in the proper justification of the words in the line and together render this process unsatisfactory. It has also been found, where the separate lines are unleaded and required to be very close together, as in matter composed of the smaller-sized type, that the act of taking the impression of the succeeding line disturbs the mold or impression made by the previous line, crowding the walls thereof inward, and thus producing unsatisfactory work.

While wax may be and has been used with a degree of success in taking impressions line by line, no method has heretofore been discovered, to my knowledge, of practically producing a stereotype-mold letter by letter, owing to the closeness or small space between the letters in the line and the consequent tendency to crowd and injure the wall or mold of the preceding letter by the act of making the impression for the succeeding one, and, so far as I know, it has heretofore been deemed impracticable by those skilled in the art to successfully produce in any known matrix or mold material a stereotype-mold by making

the impressions therein letter by letter, unless, indeed, of course, the impressions of the separate letters be made so far apart in the line as to render the same unsightly and of no practical utility in the art. I have, however, after long-continued experiments, discovered a practical and successful method of producing stereotype-molds by making the impressions letter by letter in the matrix material and as close together as desired or the usual distance apart, and without injuring or impairing the mold for the preceding letter.

I have discovered that impressions may be made letter by letter and as close together as usual even with the smallest-sized type upon the end fibers of a block of dry wood, and that the type-dies in thus successively making the impressions one at a time and one after another in the line will not crowd, injure, or impair in any way the preceding impressions made in the line or in the preceding line, and that in this way stereotype-molds may be practicably and successfully produced letter by letter.

The result of my discovery or improvement in the art of making stereotype-molds is to enable me to produce stereotype-molds almost as rapidly and easily as matter can be written or printed on the ordinary typewriter.

I am aware that machines have heretofore been invented for preparing stereotype molds or matrices by taking the impressions letter by letter in a matrix material, of which class of machines those shown in the patents to McElheran, Nos. 20,018 and 21,208, and other patents of the United States heretofore granted, may be considered as illustrative. Such prior patents show machines which may be used in practicing my process. The machines shown in such prior patents, so far as I am aware, have not heretofore come into any practical or extensive use, as no practical method has heretofore been known whereby the impressions of the letters could be made one by one sufficiently close together without disturbing or impairing the impression of the preceding letter or line, and my experiments have demonstrated that the impressions cannot be so made one by one, and with the usual small space between the let-



ters, in wax, clay, papier-maché, paper, copper, zinc, wood, type-metal, or any other material, so far as I have discovered, excepting upon the end fibers of a wood block. I find  
 5 that when the die strikes upon the end fibers of a wood block those fibers which are under the die are compressed longitudinally, and as they are compressed they separate from the surrounding fibers and leave a smooth clean-  
 10 cut wall, and that the surrounding fibers will remain undisturbed and not be crowded laterally, however thin may be the space or wall between the contiguous letters. In this respect the longitudinal fibers of the wood block  
 15 act as if they were each independent and separate from the others. I find also that when the wood block is cut across its grain, so that the end fibers of the wood will be struck and compressed longitudinally by the  
 20 type-die, the wood-block matrix material is soft enough to yield readily to the type-impressing device or die, and that the longitudinally-compressed fibers are non-elastic, so that they will not spring back when the type-  
 25 die is withdrawn, and so that the impressions of all the letters in the line may be made of the same uniform depth and give the requisite uniform height to the printing-faces of the stereotypes cast therefrom. I also find  
 30 that the driving in or sinking of the portions of the matrix successively by the impression device takes place without disturbing the surrounding portions, and that the sunken portion separates itself cleanly and readily  
 35 from said surrounding portions, so that a sharp unbroken wall is left upon all sides of the impression, and that the driven-in portions or fibers compact upon themselves longitudinally without finding room by lateral crowd-  
 40 ing. To better accomplish this latter result I usually make and prefer to make the wood matrix-block about type-high, as that gives sufficient body in the material itself to allow the compacting caused by the impression to  
 45 take place wholly within the block itself. If the block were made too thin, the impressions made upon its end fibers by the type-dies would tend to produce protuberances upon the undersurface. Less height, however, than  
 50 type-high may be advantageously used. If the block is made very thin, however, it should preferably be secured to some non-elastic backing. In preparing the wood matrix-block I take thoroughly-dried wood, either  
 55 hard or soft, give the surface to be impressed, which is formed by the end fibers, a smooth finish, and preferably coat it with thin flour paste or some other soft liquid preparation which will fill the pores of the wood and not  
 60 crack or flake off when the impressions are made one by one successively therein and not interfere with the subsequent casting operation. Of course it will be understood that where the impression of the matrix material  
 65 is not made letter by letter, but the impression taken from a whole line or form of type at a time, this difficulty of crowding or im-

pairing the walls of previous impressions made in the matrix material does not exist. In such case where the whole line or form is  
 70 impressed at once the contiguous type support and protect each other and the impressions made thereby.

To enable my process to be more clearly understood, I have shown in the accompanying  
 75 drawings, which form a part of this specification, a wood block and a crude device for forming the impressions letter by letter in or upon the end fibers of the wood.

In the accompanying drawings similar letters of reference indicate like parts. 80

In said drawings, Figure 1 is a perspective view illustrating the process of forming the impressions on the end fibers of the wood-  
 85 type block, one by one, successively. Fig. 2 is a face view of the wood-block stereotype-mold after the same has been made by the process. Fig. 3 is a section on line 33 of Fig. 2. Figs. 1, 2, and 3 are enlarged for sake of  
 90 clearness in the illustration. Fig. 4 is a plan view of a small portion of my wood-block matrix-mold as produced by my process and of the natural size. In this latter figure the type  
 95 are of brevier size, and better indicate the small spaces required to be left between the contiguous letters in producing a practical stereotype-mold for actual and practical use.

In said drawings, A represents the body of the block, and *a* the longitudinal or vertical  
 100 fibers of the wood. The upper surface *a'*, upon which the impression is made, is rendered smooth by planing and polishing. The fibers run in the direction indicated in the drawings, so that the ends of the fibers are  
 105 presented to the type-dies, and so that the impression and the compression of the fibers must take place in the direction of the length of the fibers. The impression-surface *a'* thus  
 110 composed of the ends of the fibers may be and preferably is, coated with thin liquid flour paste, so as to fill or partially fill up the pores of the wood therewith and give the surface  
 a full even polish.

B represents a type-wheel furnished with a set of type-dies *b*. 115

C represents a hammer or lever by which the type-dies are struck or operated individually and successively to make the impression on the end fibers of the wood block A as each separate type-die is successively  
 120 brought into position.

D represents a movable bed, upon which the matrix-block A is secured, and *d* a screw for moving the matrix-block bed the space of  
 125 one type after each impression.

E represents a cam on the shaft *e*, for operating the lever C.

Of course it will be understood that the impressions of the type-dies on the end fibers of the wood block may be made by hand or  
 130 by any suitable machine known to those skilled in the art—such, for example, as those shown and described in the prior patents of the United States hereinbefore referred to.



and that I have here indicated at Fig. 1 simple devices which may be employed for the purpose of more clearly explaining my process.

5 I claim—

1. The improvement in the art of preparing stereotype-molds, consisting in making each separate letter in the line successively and one at a time on the end fibers of a wood  
10 matrix-block, substantially as specified.

2. The improvement in the art of preparing stereotype-molds, consisting in subject-

ing the matrix, consisting of a block of dry wood having a smooth surface for receiving the impressions formed upon the ends of the  
15 fibers and sufficient body to resist the compacting-pressure, to the successive impact of the type-dies striking in close proximity to each other, substantially as specified.

CHARLES SEARS.

Witnesses:

EDMUND ADCOCK,  
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