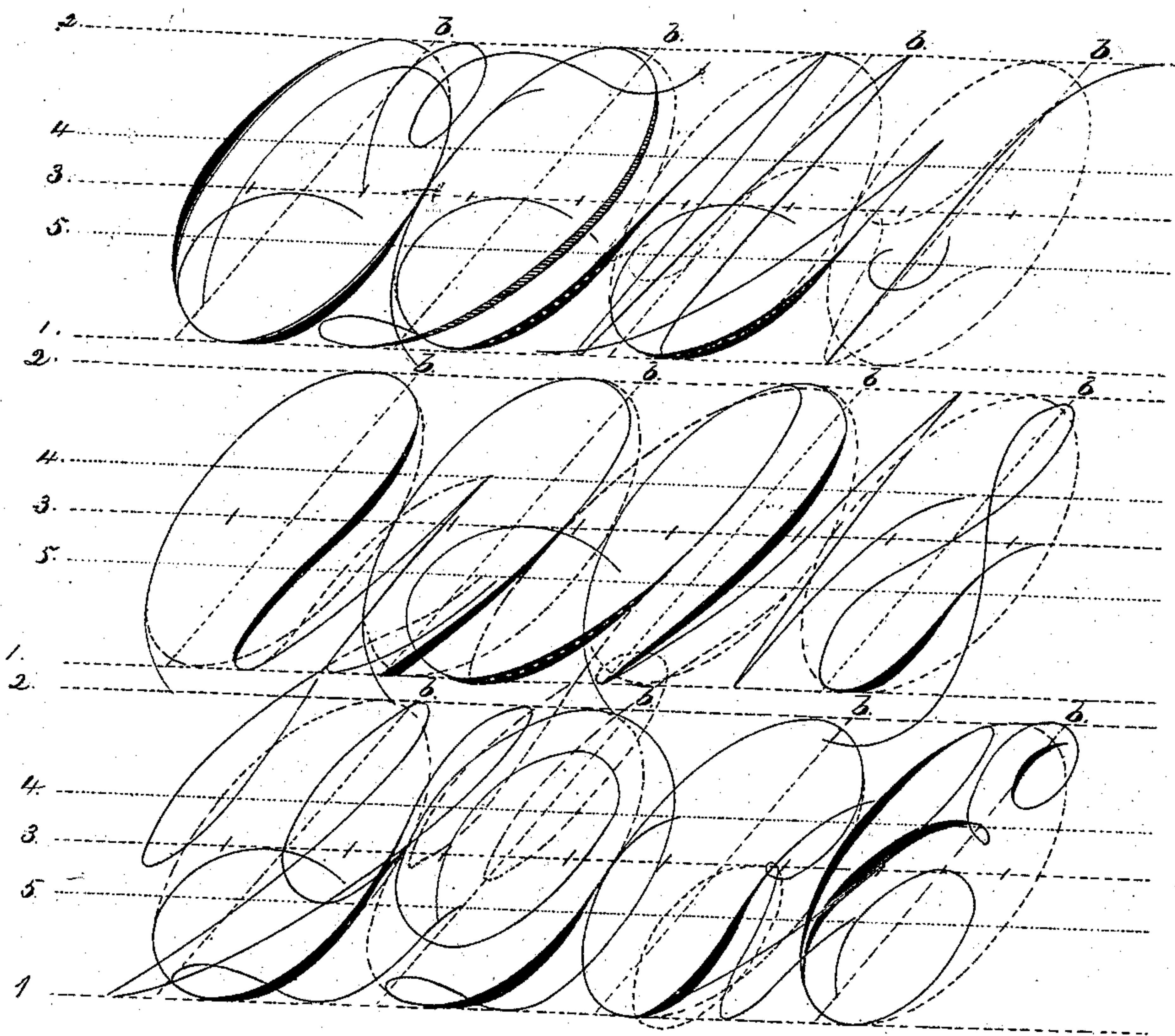


J. W. C. GILMAN.  
BLACKBOARD.

No. 182,065.

Patented Sept. 12, 1876.



Witnesses:  
Thos. Wm. Clarke  
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# UNITED STATES PATENT OFFICE.

JONATHAN W. C. GILMAN, OF MALDEN, MASSACHUSETTS.

## IMPROVEMENT IN BLACKBOARDS.

Specification forming part of Letters Patent No. **182,065**, dated September 12, 1876; application filed June 29, 1876.

*To all whom it may concern:*

Be it known that I, JONATHAN W. C. GILMAN, of Malden, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Instructors' Blackboards, of which the following is a specification:

In teaching drawing, writing, map-making, surveying, platting, and like branches where the pupil is to be taught in any respect graphic construction, or is to use graphic illustration, it has been observed that the pupils make more rapid advances if the instructor accompanies and illustrates on the blackboard to the pupil, explaining as he goes along the example which the pupils are doing at their respective desks; but it frequently happens that the teacher is deficient in the manual dexterity for this work, and is reluctant to attempt it, and the pupils are either obliged to be content either with the text-book alone or with an oral explanation more or less borrowed from the text-book without the graphic demonstration.

This invention is intended to furnish to the instructor a means of illustrating common branches accurately, and yet without demanding the skill in which they are deficient. It consists in printing, in low tone, on the prepared surfaces of pasteboard, so generally in use as slates, writing and drawing tablets, and blackboards, the guide-lines and construction-lines, and the illustration itself, in so low a tone that, though distinguishable to the demonstrator at the board, it is indistinguishable to the pupils at their distance.

A variety of designs may be printed over each other, the lines of each diagram being uniform in tint but distinguished into construction-lines of form by being slotted or continuous, and the diagrams having each a tint of its own; but I prefer, in lieu of this, to print only one diagram to a board and to make it by covering the board, except on the diagram-lines, with the tint, and leaving the gritty blackboard-surface to take the chalk. The instructor goes over with chalk the lines of the diagrams he is instructing upon, dotting the dotted lines, making the continuous lines continuous, and shading the shaded lines, explaining as he goes. The scholars

thus see every part growing before their eyes equally with their own advance with the copies under their hands.

To illustrate by drawing, so far as may be, this invention, I have taken a set of capitals of the modern type. I have made construction-lines to illustrate their formation, as follows: The base-line and head-line, measuring the vertical extension of the letters, are dotted in horizontally, and another horizontal dotted line is drawn half-way between them to form the boundary upward for the tails of such letters as A, E, F, G, H, I, K, M, N, S, T. Other horizontal lines are dotted in above and below this median line, substantially or in a different dotting, so as to divide the space between the base and head lines into thirds, and serve as boundaries to parts of the T, F, H, K, Y, W, D, A, R, and so on. Slope-lines indicating the slope of the letters are also dotted in. These straight lines form the ordinates and abscissas, as it were, of the curves we are about to construct.

In the drawing, the base-line is numbered 1, the head-line 2, the median line 3, the upper thirds-line 4, the lower thirds-line 5, and the slope-line 6. The teacher brings this all out on the board in chalk, marking over the lines printed in low tone, and imperceptible to the pupil, explaining as he goes. Having now got to the point of forming the letters, the instructor goes on explaining that, in capital script, the letters are each and all so referable to ovals inscribed on the slope-lines as a long diameter, and touching each other, that it will be found of great assistance to learn to make such accurately, and he proceeds to draw in a series of ovals, also as construction-lines, forming frequently parts of letters. Then taking the letters one by one, he draws and shades them, pointing out and explaining as he goes their relations to the construction lines and ovals. It will be readily seen that, by having these things all on the boards in low tone to be covered by chalk, the work of the teacher is much facilitated. It is necessary, in closing this work, to select for the tints colors of very little body, and to mix them so as not to polish the surface or render it greasy. Transparent white ink is perhaps the best, and inks made

with a minimum of oil are better than ordinary printers' ink.

I claim—

The described improvement in instructors' blackboards, consisting of a blackboard-surface, prepared for writing or drawing with chalk, and having faintly printed thereon, in tints of low tone, construction-lines, illustra-

tions, and diagrams, to be successively developed and brought out by the teacher by the aid of chalk-drawing, substantially as and for the purpose described.

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Witnesses:

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