3 Sheets—Sheet 1.

G. H. FELT.

SIGNAL CODE FOR ROCKETS.

No. 40,744. Patented Dec. 1, 1863.

Fig. 1. Plate 1.

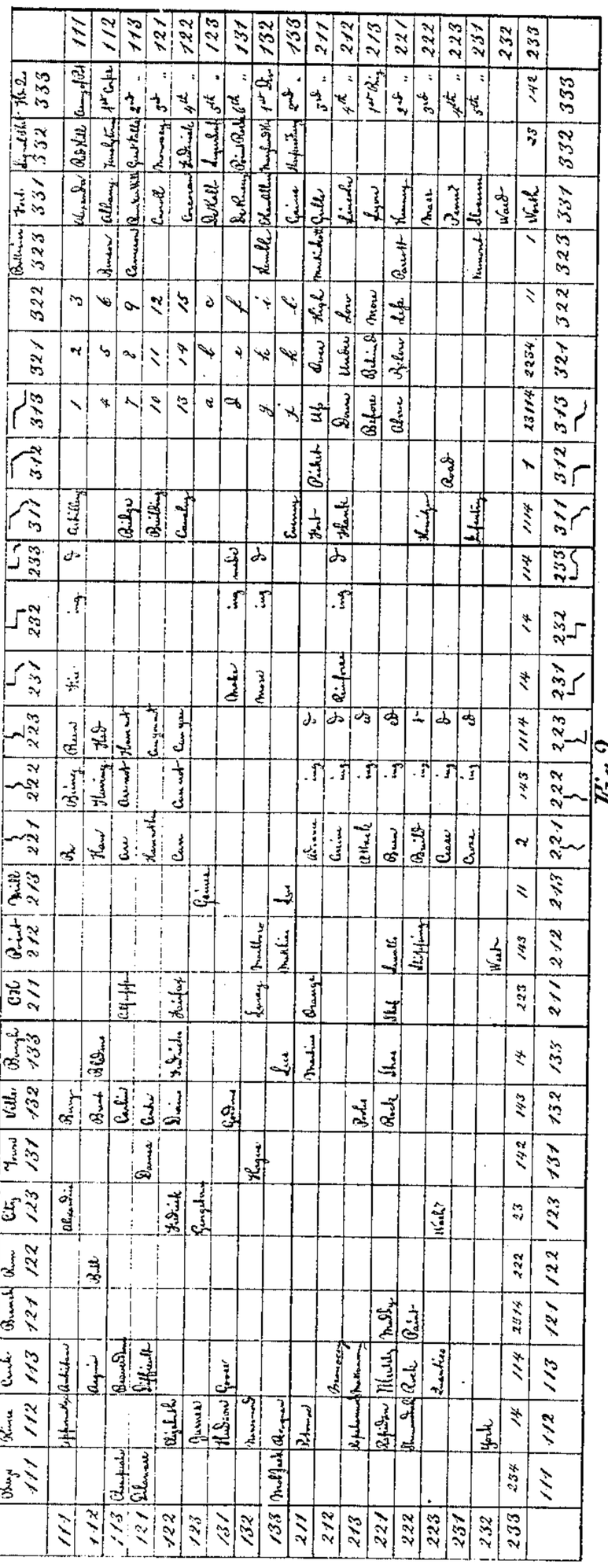
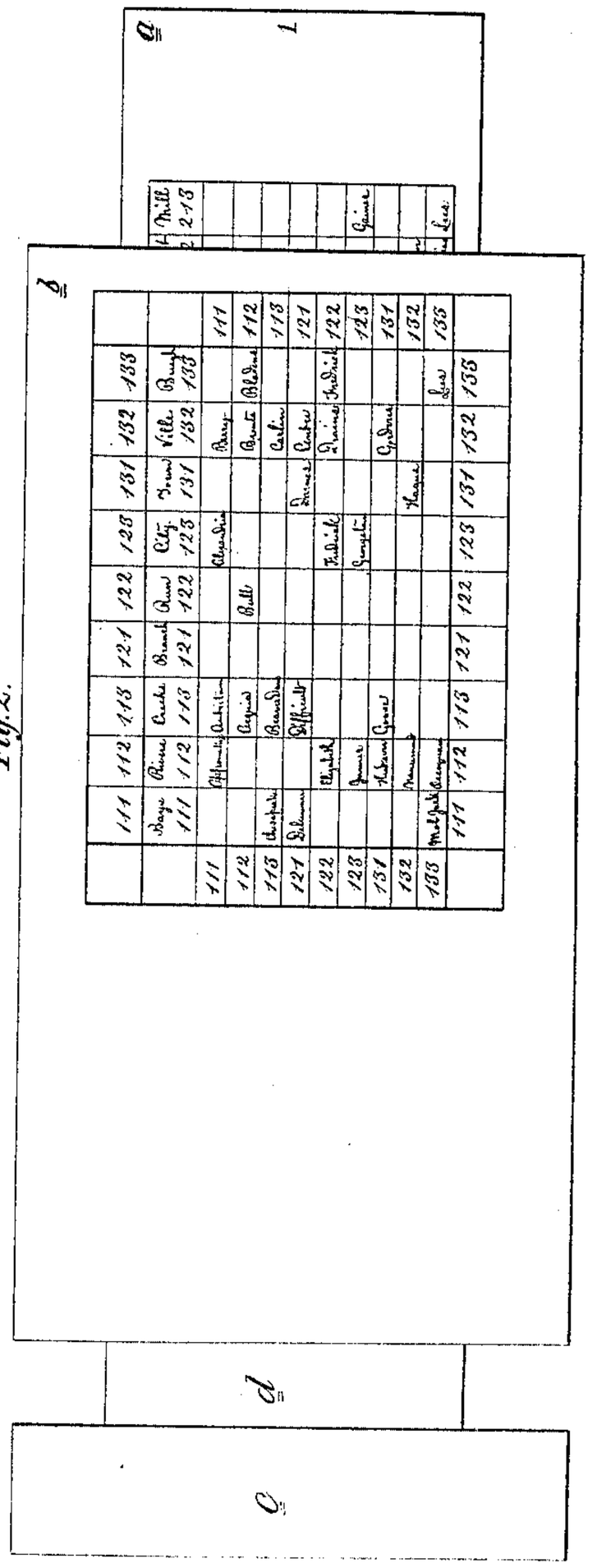


Fig 2.



Witnesses.

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Inventor:

George H. Felt.

3 Sheets—Sheet 2.

G. H. FELT.

SIGNAL CODE FOR ROCKETS.

No. 40,744. Patented Dec. 1, 1863.

Fig. 1.

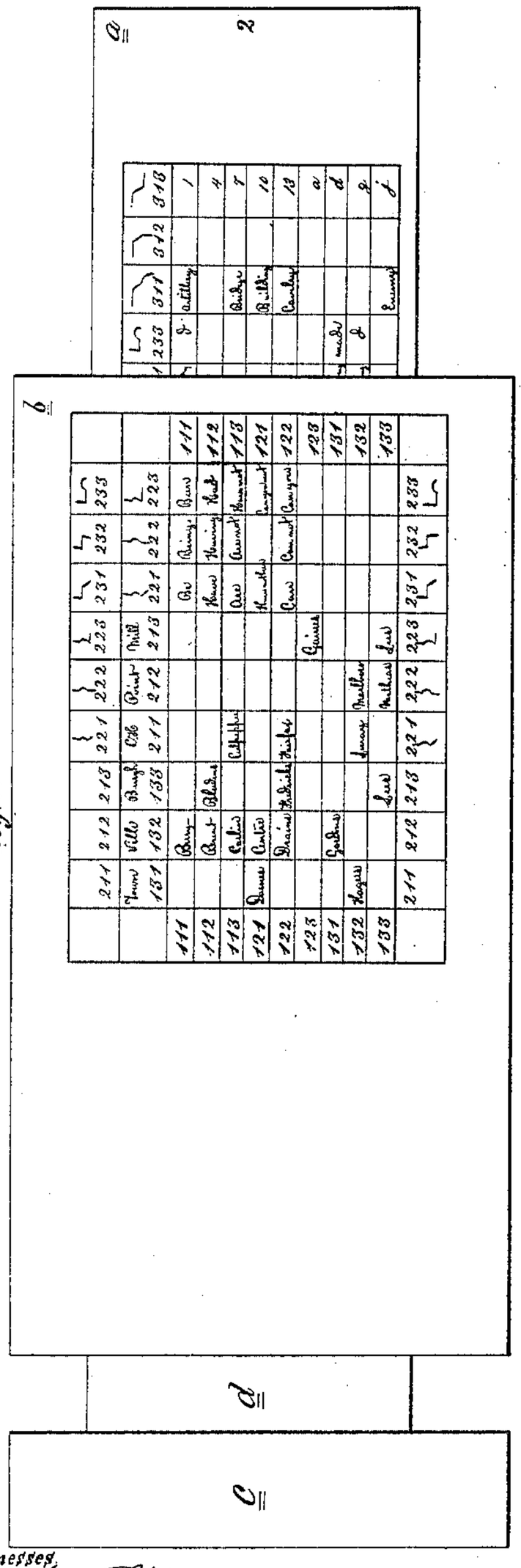
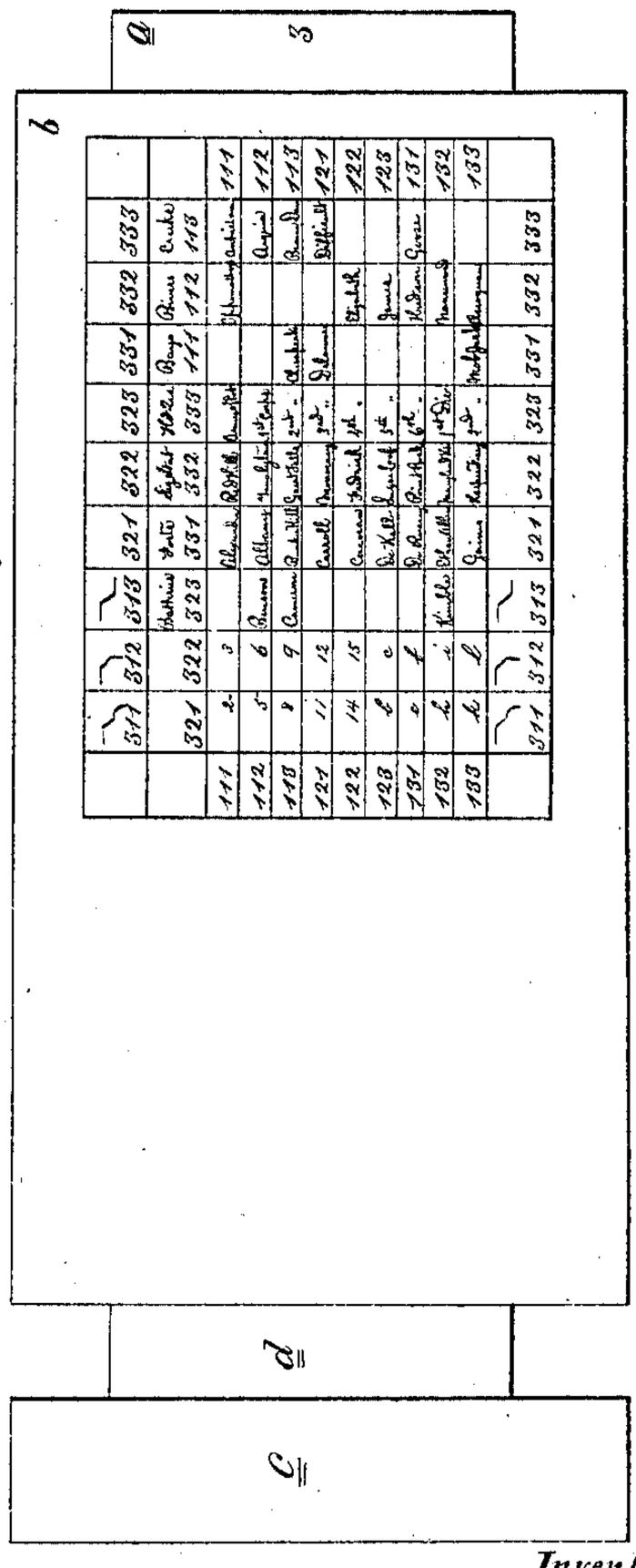


Fig. 2.



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B. W. White

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SIGNAL CODE FOR ROCKETS.

No. 40,744. Patented Dec. 1, 1863.

Plate. 3.

Fig. 1.

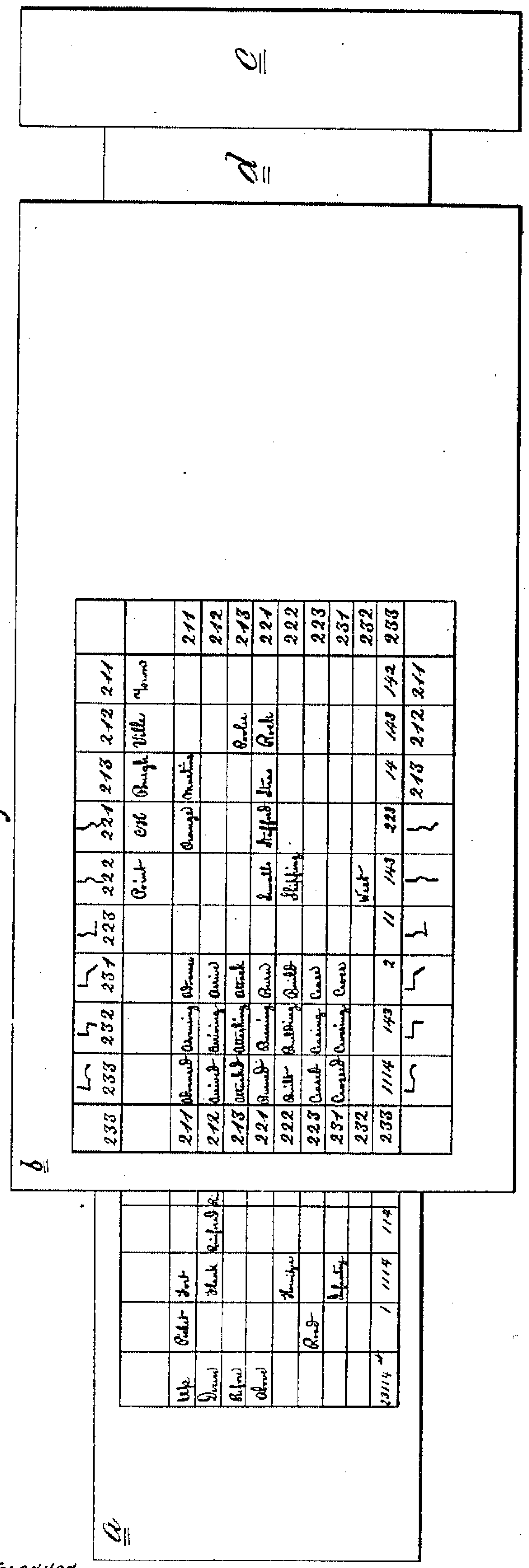
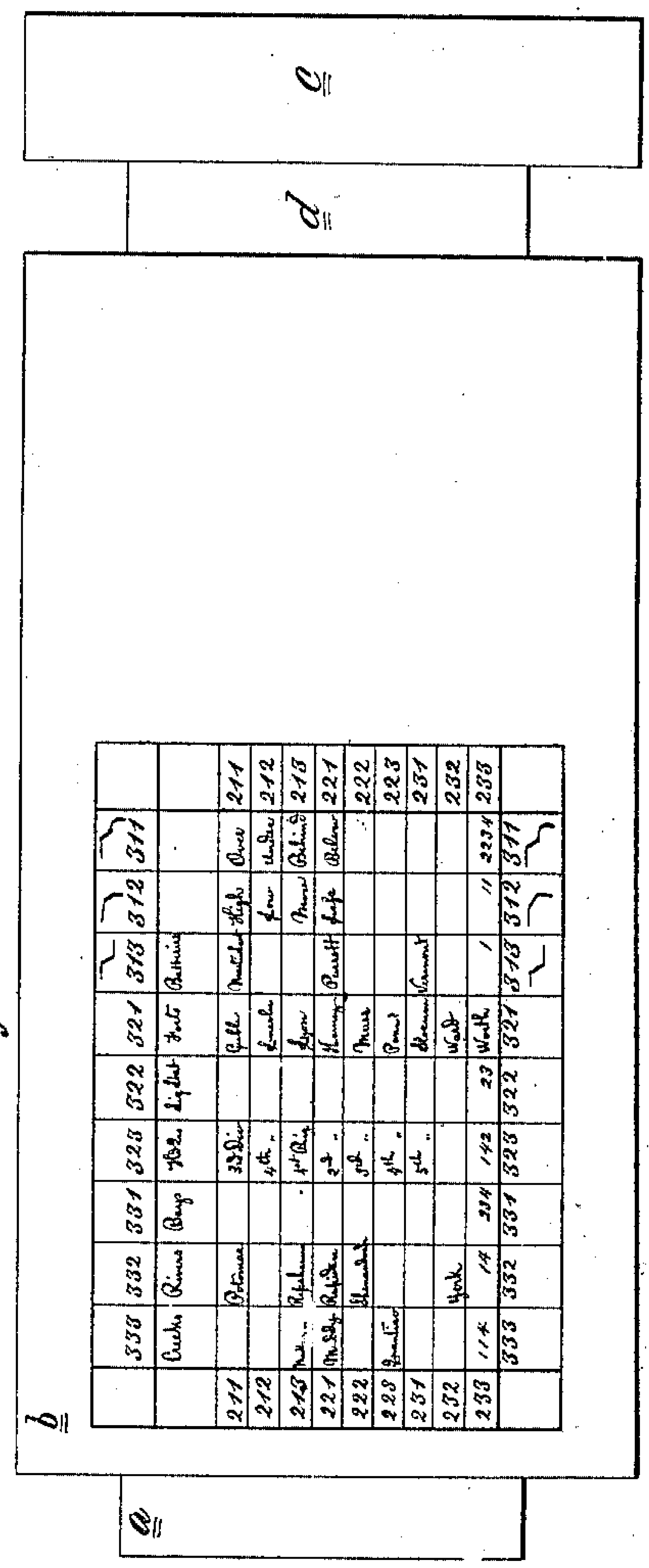


Fig. 2.



Witnesses.
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J. W. White

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UNITED STATES PATENT OFFICE.

GEORGE H. FELT, OF NEW YORK, N. Y.

IMPROVEMENT IN SIGNAL-CODES FOR ROCKETS.

Specification forming part of Letters Patent No. **40,744**, dated December 1, 1863.

To all whom it may concern:

Be it known that I, GEORGE H. FELT, of the city, county, and State of New York, have invented a new and improved method of communicating intelligence by signals, by means of rockets, Roman candles, cold lights, flags, and lanterns, &c.; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

This invention is more especially designed for signaling for military and other operations; and it consists in arranging spaces representing letters, or words, or figures, or combinations of the same, in a series of columns, which spaces in any of these columns are designated in the code by the number, or letter, or sign designating the column in which the desired space is found, and the number on the side designating the layer or lateral column in which the space is found, the intersection of which points out the space desired to be designated, which definition will be more distinctly understood by reference to the drawings, Plate 1, Figure 1. By this means a much greater number of combinations can be made than could otherwise be procured, for the following reasons: The pyrotechnic art, which is one of the most powerful and certain means of signaling, furnishes but three positive colors—red, white, and green—and the combinations that can be made with them—taking, for instance, red as 1, white 2, and green 3—are very limited, being but twenty-seven when signals of three elements are used, as in the present code, Plate 1, Fig. 1, 111@333, which, when arranged as this code, will give $27^2=729$. The rockets which I propose to use with this code are rockets of my Patent No. 39,636, dated August 25, 1863.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

Plate 1, Fig. 1, represents the code arranged for all the combinations of three elements designating the columns, twenty-seven in number, and the combinations from 111@233, eighteen in number, designating the layers or lateral columns. To designate any one of these spaces, it is necessary to designate the number on the top and the number on the side, and their intersection will be the space required. For instance, to send the message—

"Headquarters, Third Corps, Army of the Potomac. Enemy crossing the Potomac River at Muddy Branch. Signed, Signal Station, Point of Rocks;" use as follows:

Headquarters, Third Corps, Army of the Potomac.	Enemy	crossing the	Potomac River	at Muddy Branch.	Signed, Signal Station, Point of Rocks;
$\frac{333}{121}$	$\frac{311}{133}$	$\frac{222}{231}$	$\frac{112}{211}$	$\frac{121}{221}$	$\frac{232}{131}$

and in this manner to send any message that can be sent by the code. Plate 1, Fig. 2, represents the code arranged on sliding leaf in frame *b*. Plate 2, Fig. 1, represents the sliding leaf No. 2 drawn out three spaces to the right. Plate 2, Fig. 2, represents the sliding leaf No. 3 moved three spaces to the left. Plate 3, Figs. 1 and 2, represents the reverse sides of Plate 2, Figs. 1 and 2.

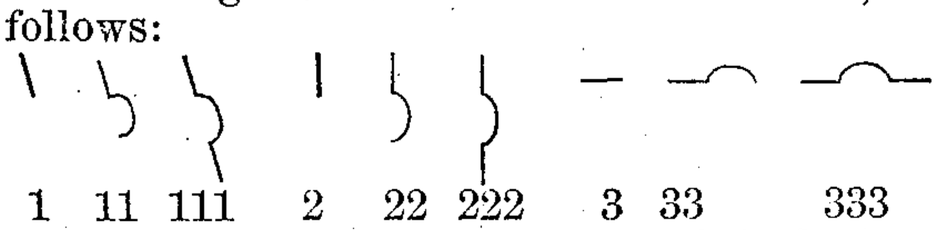
Similar letters of reference indicate corresponding parts in the similar figures.

For the more convenient carrying and use of this code, it is arranged or divided by sections into leaves *a*, which are held in frames *b*, which frames are attached or bound in book form *c* by long flexible hinges of parchment or other material, *d*. The leaves *a* are made to slide in and out of the frames *b*, whereby the relative positions of the columns and frames are changed. The leaves are also made so that they can be taken out and put into any other frame, by which means a greater variety of changes can be produced. For instance, the leaf 1 can be placed in the frame 3, and the leaf 2 in the frame 1, and the leaf 3 in the frame 2. The object of making these changes is to be able to change the code as often as may be necessary to prevent the code from being used if it should fall into the hands of the enemy by accident or treachery.

It will be observed by reference to the drawings, Plates 2 and 3, that both sides of the movable leaf and frame are used, the reverse side being arranged to run either in the same or contrary direction. In the drawings, Plate 2, Figs. 1 and 2, the numbers run from left to right, and on the reverse sides, Plate 3, Figs.

1 and 2, the numbers run in a contrary direction—*i. e.*, from right to left. This is an additional means of changing the relative position by running the numbers on the reverse side in the same direction—*i. e.*, from left to right—which will be readily perceptible, but would require another model and set of drawings to show, as by this means the upper half of the code is moved in one direction and the lower half in the other direction.

As the numbers to be designated are composed of but three elements, 1, 2, and 3, which, respectively, stand for the colors, say, red, white, and green, I have arranged the following method of notation, by which expedition is attained and the person enabled to put down the numbers without looking at them. For instance, red is represented by the oblique mark \, white by the perpendicular mark |, and green by the horizontal mark—. Combinations of the same element may be shown by introducing a curve in the same direction, as follows:



1 11 111 2 22 222 3 33 333

See code Plate 1, Fig. 1, 221 @ 313, inclusive.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination in columns of spaces representing words, letters, figures, or combinations of the same, any one of which can be designated by the corresponding numbers of the column and layer, the intersection of which will be the space required, substantially as and for the purposes herein specified.

2. Arranging these columns on leaves, which leaves are made to slide in an out of the frames, whereby the relative positions of the spaces are changed, substantially as and for the purposes herein specified.

3. Arranging these columns on both sides of the frames and movable leaves, substantially as and for the purposes herein specified.

4. Designating the colors or numbers by characters instead of numerals, substantially as and for the purposes herein specified.

GEORGE H. FELT.

Witnesses:
WM. H. ARTHUR,
HENRY G. PEARSON,
J. W. WHITE.