

T. A. WATSON.
Electric Switch Board.

No. 229,345.

Patented June 29, 1880.

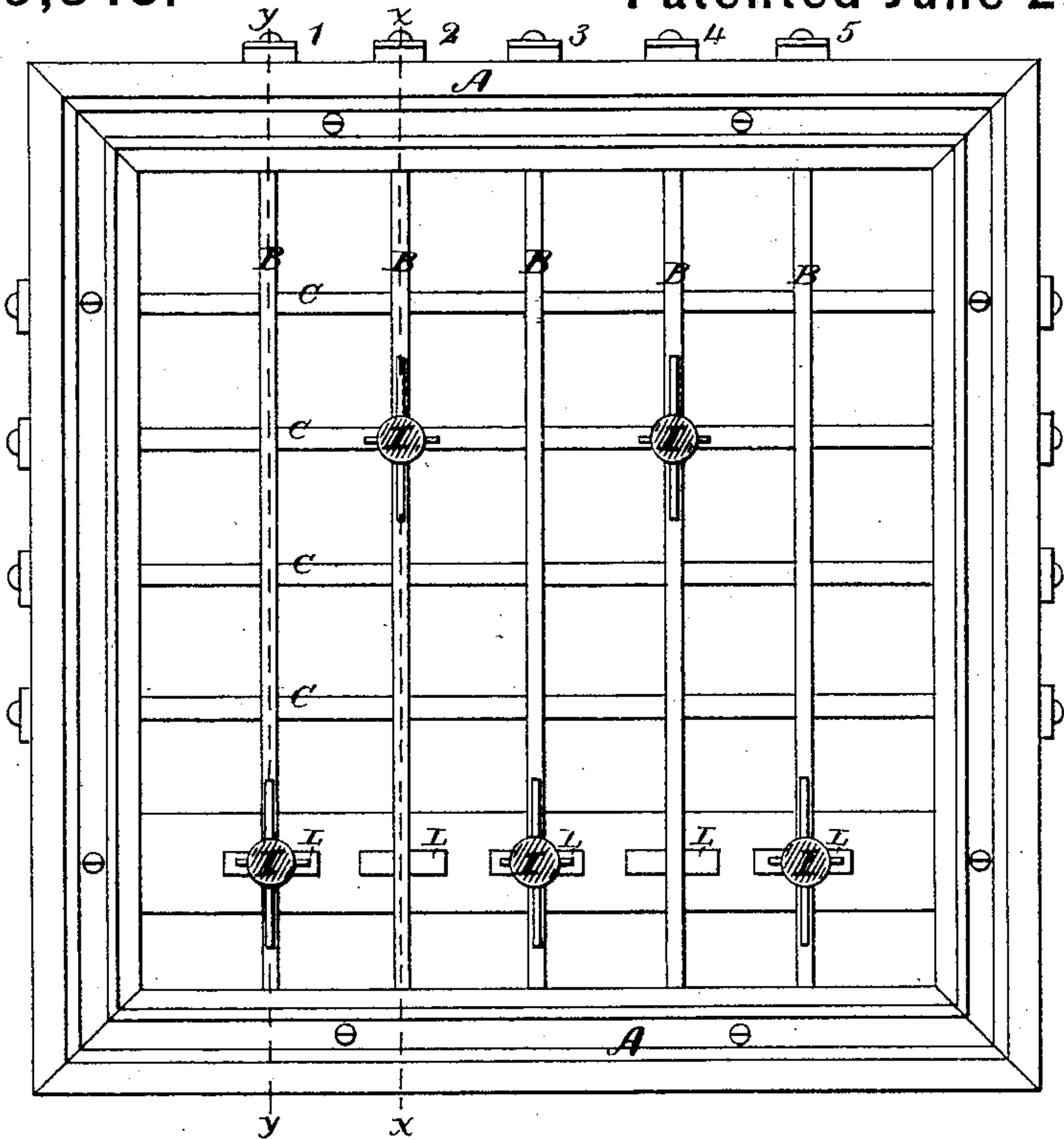


Fig. 1.

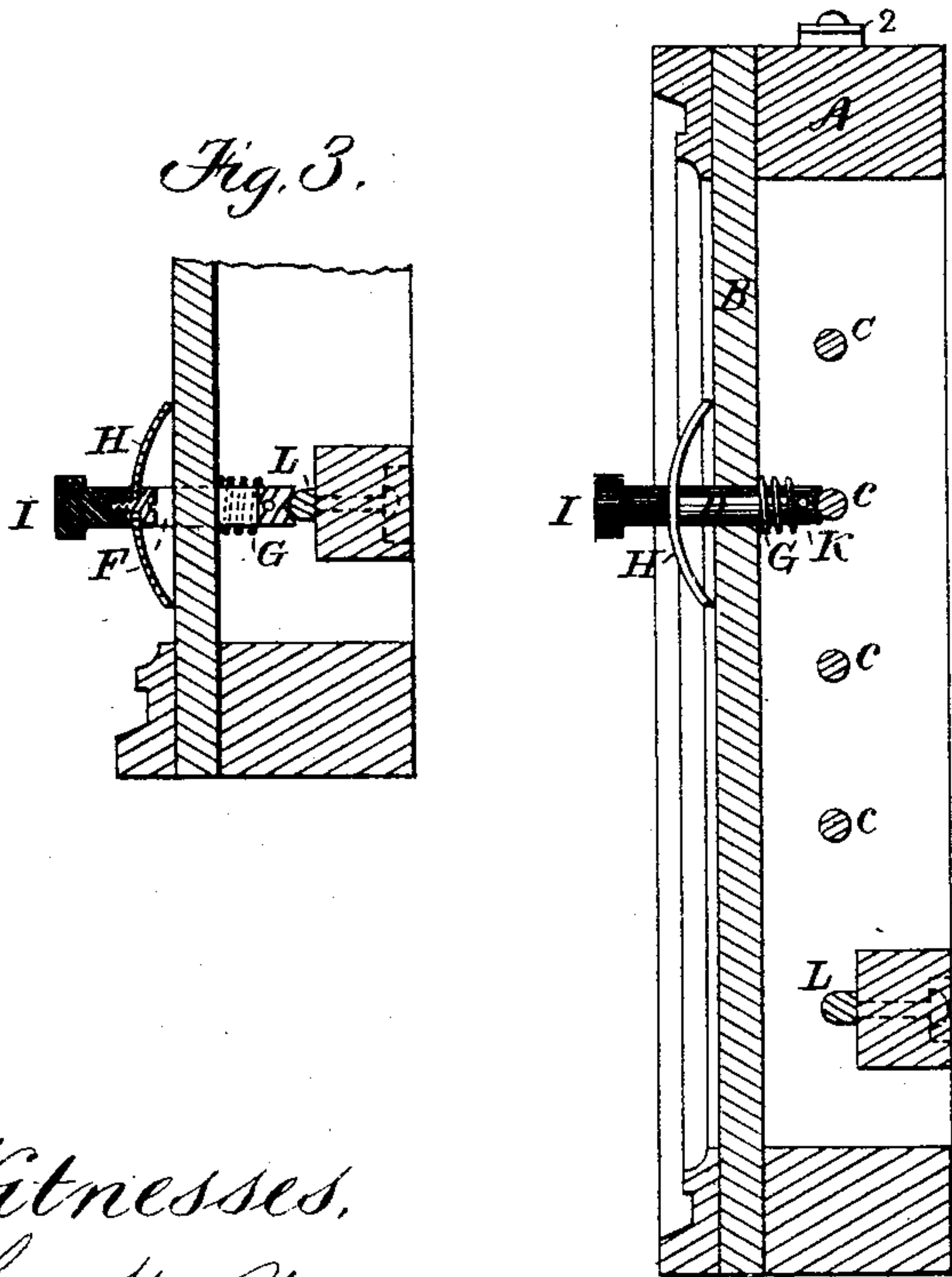


Fig. 2.

Fig. 3.

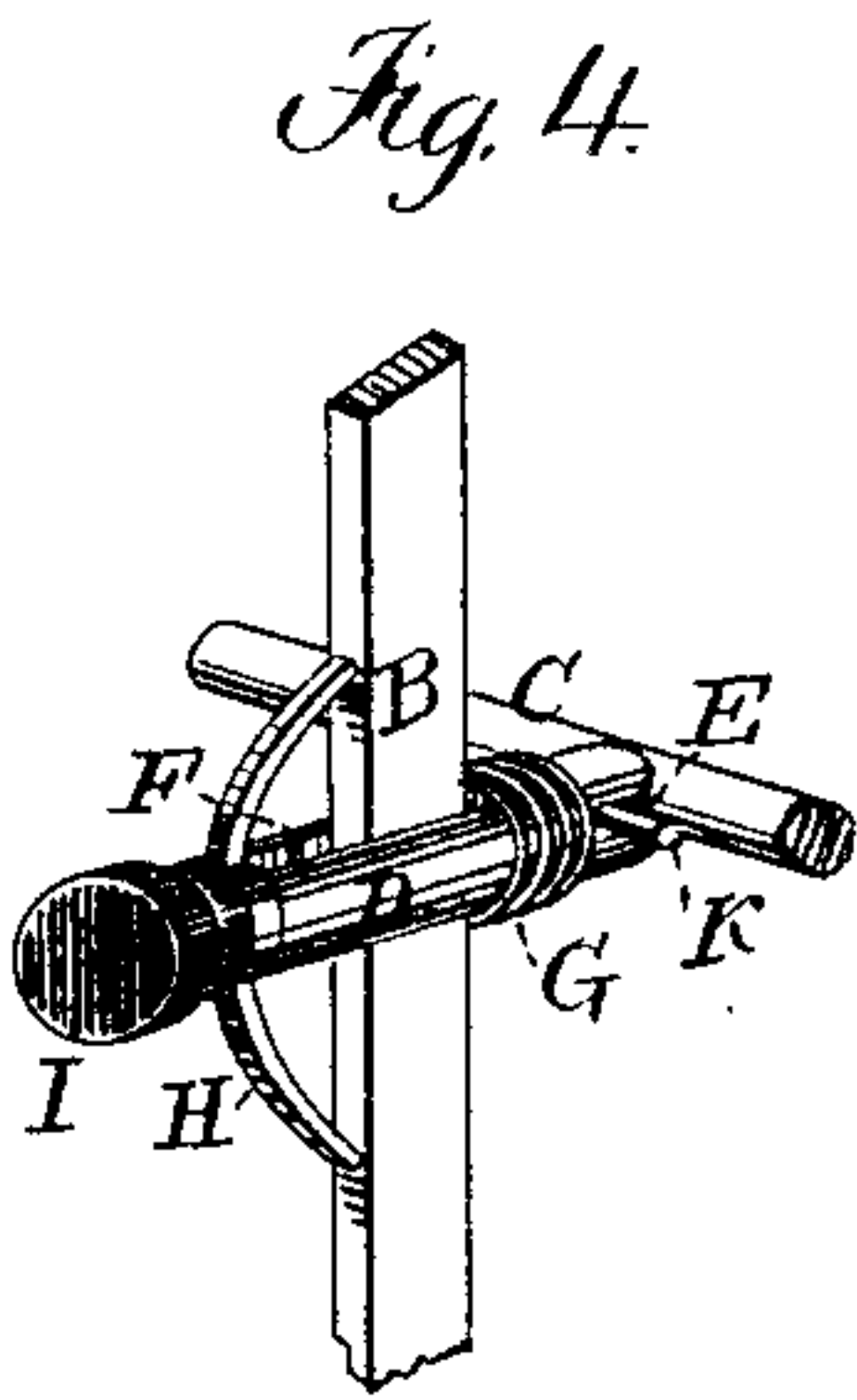


Fig. 4.

Witnesses,
Geo. W. Pierce.
C. J. Brown.

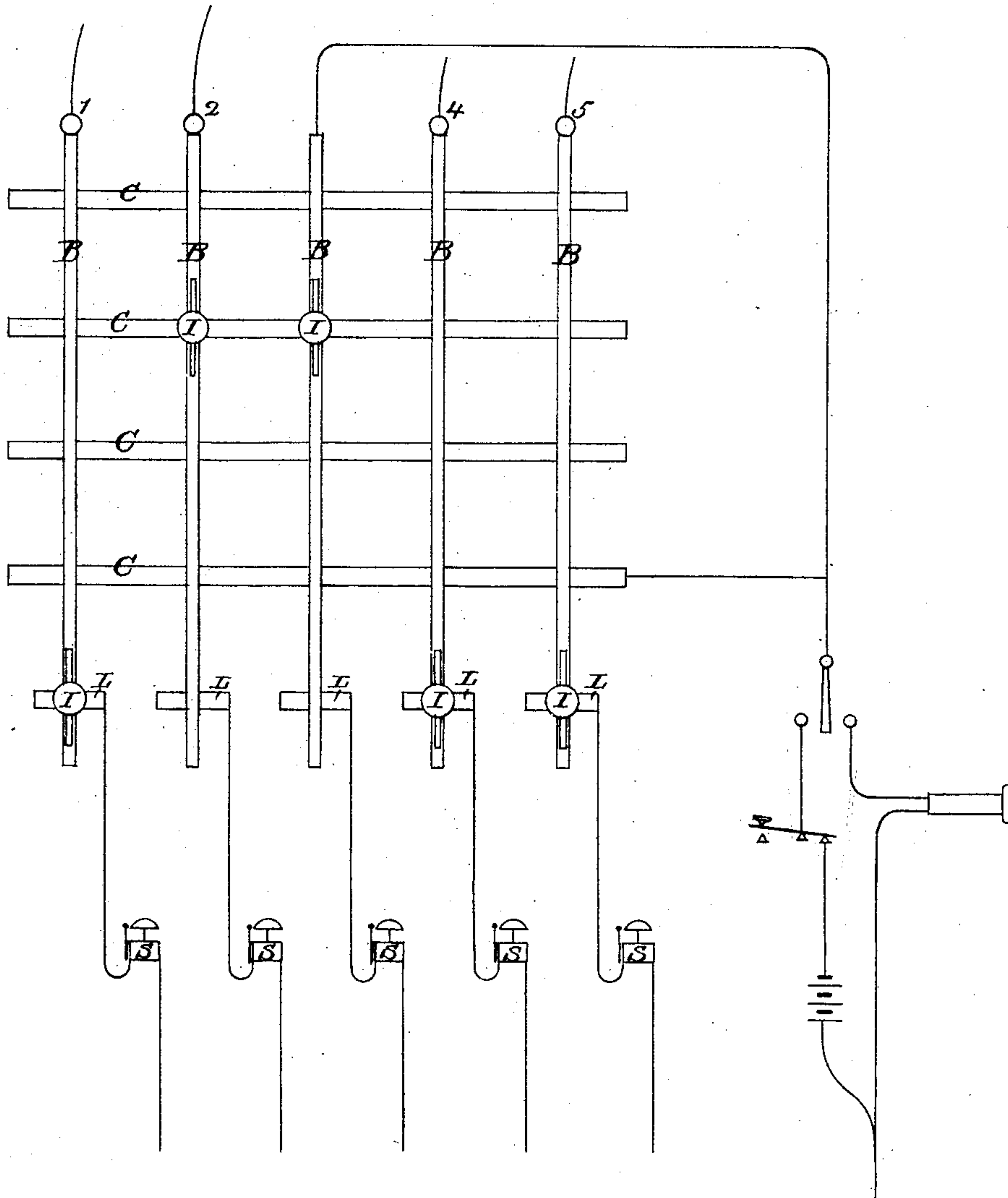
Inventor,
Thomas A. Watson.
By his Attorney,
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Fig. 5.



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UNITED STATES PATENT OFFICE.

THOMAS A. WATSON, OF EVERETT, MASSACHUSETTS.

ELECTRIC SWITCH-BOARD.

SPECIFICATION forming part of Letters Patent No. 229,345, dated June 29, 1880.

Application filed January 23, 1880.

To all whom it may concern:

Be it known that I, THOMAS A. WATSON, of Everett, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Switch-Boards for Telegraphic and Telephonic Purposes, of which the following is a specification.

The object of this invention is to provide a means for establishing at an office at will, with greater rapidity and more certainty than by the switch-boards now in use, an electrical connection between the several circuits of a telegraph or telephone system entering said office; and to this end the invention consists in the combination, with two series of metallic strips, bars, or rods arranged so that one series is crossed by the other series, of a series of movable metallic connectors or contacts, each of which is in connection, respectively, with a strip of one of the series, is capable of being moved so as to make connection with any one of the strips of the other series, and when released by the operator is automatically forced against and maintained in contact with said strip, and in connecting each strip of one of the series to one of the circuits entering the office.

The invention also consists in providing the board with a series of connections insulated from one another, but each in connection with a suitable annunciator or other apparatus for receiving signals, and in the manner of connecting the switch-board with a signaling apparatus, battery, and telephonic apparatus at the office, whereby the said office is enabled to signal or communicate by telephone on any circuit connected to the board; and the invention further consists in the construction of the metallic connectors or contacts, whereby perfect electrical contact is insured, and also in means whereby the operator is able to ascertain whether or not the metallic connector or contact is in its proper position on the connecting strip or rod.

In the accompanying drawings, Figure 1 is a front view, in elevation, of a switch-board constructed according to the principle of my invention. Fig. 2 is a sectional view of the same on the line *x x*, Fig. 1. Fig. 3 is a sectional view of a part of the same on the line *y y*, Fig. 1. Fig. 4 is a view, in perspective,

of one of the metallic connections or contacts; and Fig. 5 is a diagram, showing the electrical connections with the annunciators, battery, signaling apparatus, and telephone at the office.

In these several figures the same letters refer to the same parts.

Referring to these figures, A is a frame, of wood or of some other suitable insulating material, and B B are a series of metallic bars, rectangular in section, inserted into the front of the frame parallel to one another. Each of these bars is connected, respectively, with one of the circuits of a telegraph or telephone system. Under these bars B B, and crossed by the same, are inserted in the frame A a series of parallel metallic rods, C, preferably cylindrical, which rods form the electrical connection between any two or more of the bars B B when the metallic connector or contact on each of said bars is placed in connection with said rod, as shown in Fig. 1.

The metallic connector or contact may be made in several forms; but that shown in the drawings has been found to accomplish its purpose efficiently. It consists of a short rod of metal, D, provided with a triangular notch, E, on its lower extremity, and having in it a rectangular slot, F, through which the bar B passes. This slot is sufficiently longer than the bar is deep to permit the extremity of the connector to be fully withdrawn from contact with the rods C. A spiral spring, G, encircles the rod D below the bar B, and, bearing against the under surface of this bar, acts to force the connector into contact with the rod underneath it.

Instead of a spiral spring a spring of any other form may be used, or there may be a cam on the rod, so that a slight rotation of the same will bring its extremity into contact with the rod C.

H is a bent piece of metal, which is fixed at its center in each connector above the bar on which the connector slides, and at each extremity comes into close proximity with the upper surface of the bar on each side of the connector without touching said bar. The object of this piece is to limit the rocking movement of the connector.

Attached to each connector is a handle, I,

of some suitable insulating material, and also a pointer, K, which, by its coincidence with the medial line of the rod C, indicates when the connector is correctly placed on said rod.

5 The notch E in the connector insures its more perfect contact with the rod underneath it, and also permits the connector to be oscillated on the said rod without being disconnected from the same, thus enabling the contacts to be kept
10 clean by friction on one another.

The metallic connectors, instead of being capable of sliding on the bars B, may be fixed to the same and the bars be capable of sliding in the frame, so that the connector can be
15 placed upon any one of the cross-rods C.

L L are a series of short metallic rods insulated from one another, upon which the metallic connectors rest when in their normal position. Each of these rods is in connection with
20 an annunciator, S, or other apparatus for receiving signals, and therefore when the connectors on the switch-board are in their normal position each circuit is connected to an annunciator or other apparatus for receiving signals.

25 The circuit-wires entering the office may be connected to the cross-rods C instead of to the bars B.

In some cases the short rods L are dispensed with, and a rod similar to the rods C
30 is used, which rod is connected to the earth.

It will be obvious that by this switch-board any two circuits connected to the same can be connected together by placing the metallic connectors on the bars connected with the re-
35 spective circuits in contact with the same cross-rod, as shown in Fig. 1, in which figure circuits 2 and 4 are shown as connected together.

At the office may be placed a telephonic apparatus and a battery and key, or, instead

of a battery and key, a suitable dynamo or 40 magneto electric apparatus for sending signals, and the telephonic apparatus may be connected to one cross-rod and the signaling apparatus to another, or, as shown in the diagram, Fig. 5, either apparatus may be connected at will 45 to the same cross-rod by means of a switch. One of the bars B is also connected to this switch, and thus the operator at the office is enabled to signal or communicate by telephone on any circuit, or simultaneously on two or 50 more circuits.

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

1. A switch-board having a series of con- 55 ducting-strips, each forming part of a circuit, a series of independent isolated cross-strips, and a series of connections, each sliding on, but undetachable from, one of the first-named series of strips, all substantially as set forth. 60

2. The combination, with the series of parallel strips, each in a circuit and carrying sliding connections permanently connected therewith, of the isolated cross-strips and the insulated metallic plates, each connected to 65 form part of a signal-circuit, substantially as set forth.

3. The combination, with the rod B, of the rod D on the same and the bent piece II, inserted in the rod D, substantially as and for 70 the purpose set forth.

In witness whereof I have hereunto set my hand in presence of the subscribing witnesses.

THOMAS A. WATSON.

Witnesses:

ALEX. L. HAYES,

ARTHUR E. ANDREW.