

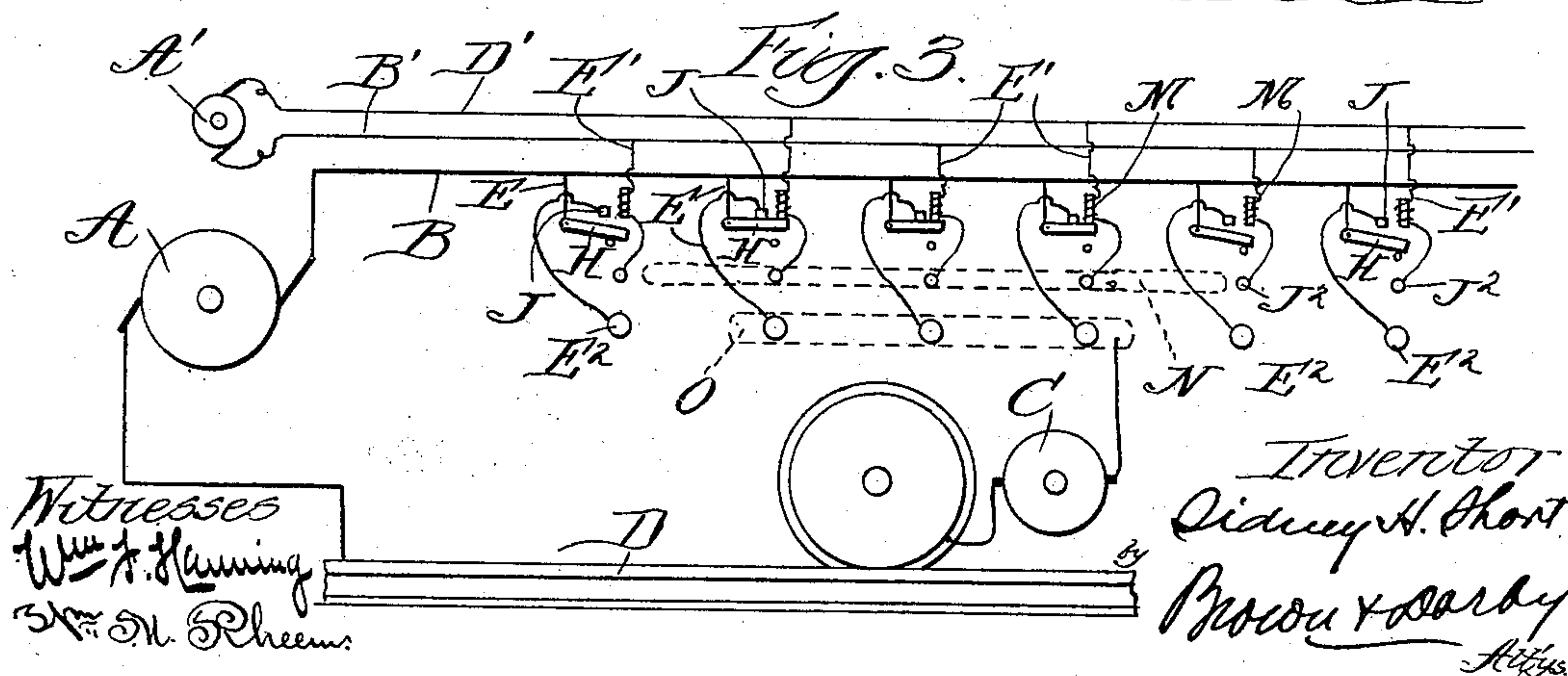
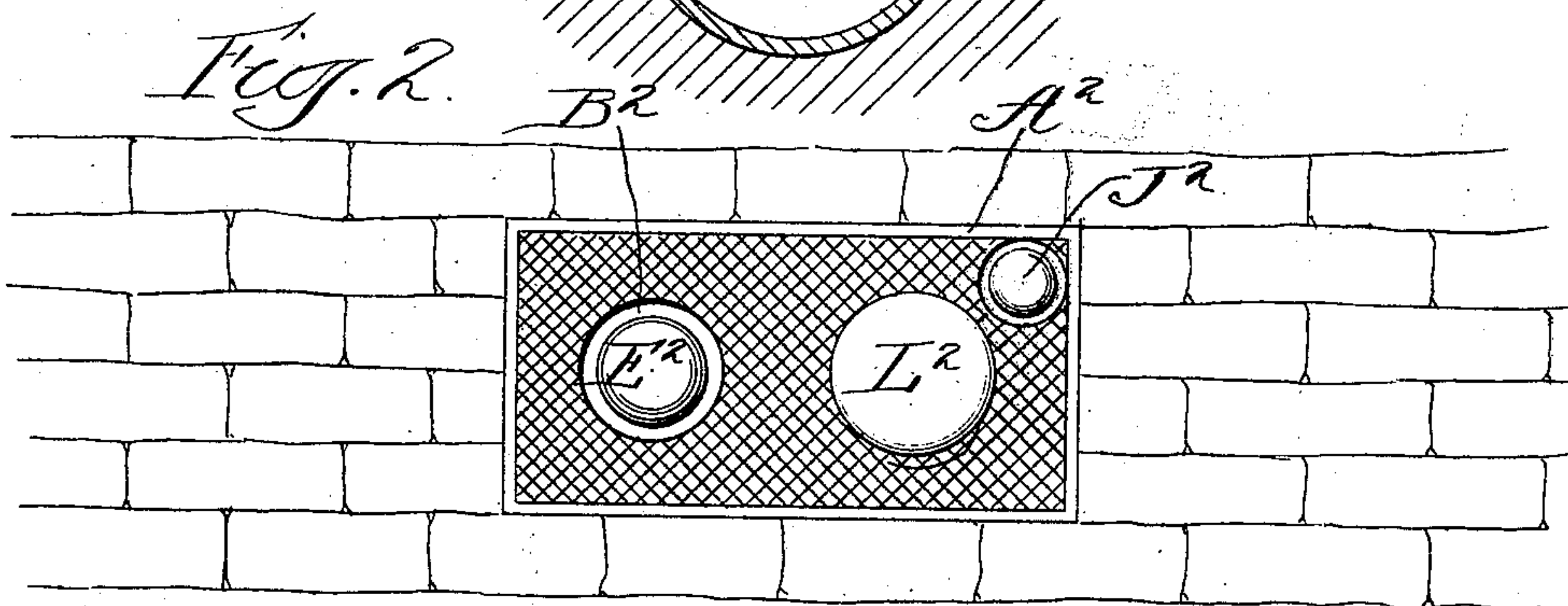
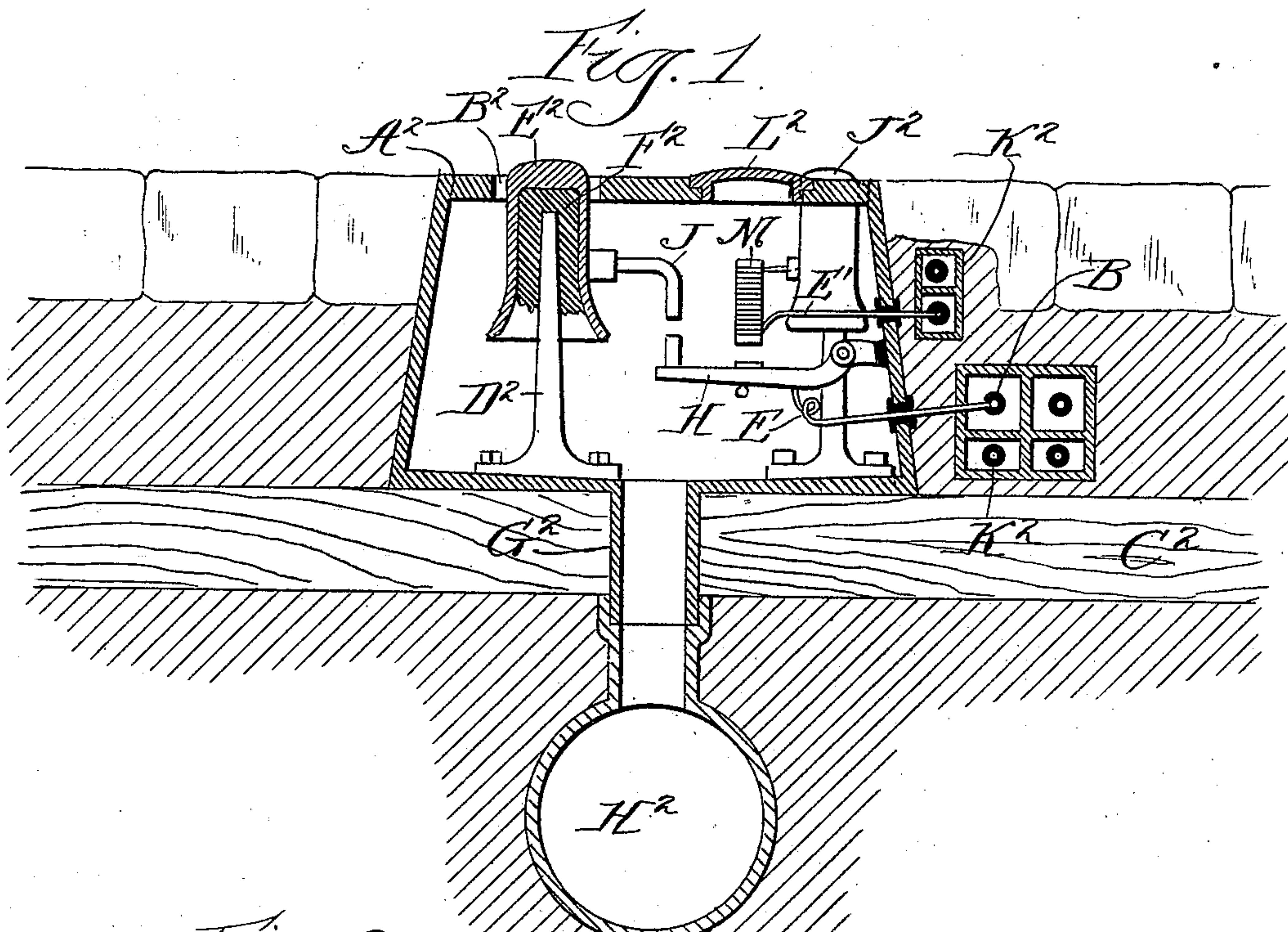
No. 607,611.

Patented July 19, 1898.

S. H. SHORT.
ELECTRIC RAILWAY SYSTEM.

(Application filed July 9, 1897.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

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ELECTRIC-RAILWAY SYSTEM.

SPECIFICATION forming part of Letters Patent No. 607,611, dated July 19, 1898.

Application filed July 9, 1897. Serial No. 643,993. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY HOWE SHORT, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Electric-Railway System, of which the following is a specification.

This invention relates to electric-railway systems, and is designed as an improvement on my pending application, Serial No. 637,886, filed May 24, 1897.

The object of the present invention is to provide a construction and arrangement wherein the surface contacts are efficiently insulated and wherein leakage or short-circuiting is avoided.

The invention consists, substantially, in the construction, combination, location, and relative arrangement of parts, as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally specifically pointed out in the appended claims.

Referring to the drawings and to the various views and reference-signs appearing thereon, Figure 1 is a transverse section of a portion of a road-bed, showing the application of my invention thereto. Fig. 2 is a plan view of the same, and Fig. 3 is a diagram illustrating the operation of a system embodying the invention.

In my prior application I have shown, described, and claimed a system wherein a current is supplied to translating devices on a car through a conductor arranged, preferably, in a conduit adjacent to the road-bed, and which conductor is tapped at suitable intervals by branches which lead to contacts arranged in or adjacent to the surface of the road-bed in position to be engaged by a contact-shoe carried by the car during the passage thereover. Each of these branches is shown and described as including a pivoted member or lever which is normally held in position to break such branches, and each of such levers forms or carries the armature of an electromagnet, which when energized moves the lever into position to complete the supply-circuit from the supply-conductor to the surface contact in the road-bed, from whence the current is conducted to the translating devices on the car by the contact-shoe

carried by the car as the car passes thereover, the current finally finding ground in any suitable or convenient manner—as, for instance, through the car-wheel to the rail in the usual manner. Provision is also made whereby the passage of the car completes the circuits of the electromagnets. This is accomplished by providing an auxiliary supply-conductor carrying a current which may be just sufficient to suitably energize the electromagnets, and hence which may be of comparatively low and harmless potential. This auxiliary conductor is also tapped at intervals by branch conductors similar and corresponding to the branch conductors of the main or supply circuit, and each of which auxiliary branches leads to a surface contact arranged in or adjacent to the road-bed, and included in each of said branches is the electromagnet, the energization of which by the flow of current through said branches actuates the lever in the main or supply branch to close said supply branch to the surface contact thereof. A contact-shoe carried by the car closes the circuit of said auxiliary branches as the car passes thereover. In the present drawings the same system is shown.

Reference-sign A designates the main supply-generator; B, the main supply-conductor; C, the translating devices on the car; D, the rail which may be utilized as the return-conductor; E, the main supply branches, each of which includes a pivoted lever H and a fixed contact J, with which said lever engages electrically when the corresponding electromagnet is energized and which contact is in electrical connection with a surface contact in the road-bed.

B' D' are the positive and negative conductors of the auxiliary circuit, E' the auxiliary branches, and M the electromagnet included in said auxiliary branches.

N is the contact-shoe carried by the car and which is arranged to complete the circuit between the positive and negative conductors of the auxiliary circuit through three or more of the auxiliary branches simultaneously, whereby the main supply-circuit is completed to a plurality of the road-bed surface contacts in the main supply branches.

O is the contact-shoe carried by the car for

completing the supply-circuit from said road-bed surface contacts through the translating devices on the car.

In an electric-railway system such as is
5 above described it will be seen that the two series of surface contacts arranged in the road-bed, although constantly exposed, are perfectly harmless for the reason that in the case of the terminal contacts of the main
10 supply branches, which are designed to carry heavy and dangerous currents, are included in branch circuits, which are normally broken and which are closed to such surface contacts only when the electromagnets of the corre-
15 sponding and coöperating auxiliary branches are energized. In the case of the surface terminals of the auxiliary branches it will be observed that each surface contact or terminal is connected with only one of the con-
20 ducting-wires of the auxiliary circuit, and as in practice the next adjacent surface contact in the same series is designed to be several feet removed therefrom the danger of acci-
25 dentally completing an auxiliary branch circuit is reduced to a minimum. Moreover, the auxiliary circuit carries a current of small potential, as above explained, and which is harmless. The greatest danger, however, is
30 in completing a circuit through an auxiliary branch, as by means of water covering the surface of the road-bed or dirt or other matter surrounding the terminals of such auxil-
35 iary branches, thereby causing such auxiliary branch electromagnets to become energized, and hence actuating the switch-lever in the corresponding main branch to close said main branch to its corresponding surface contact, thus resulting in an exposed contact charged
40 with a heavy and dangerous current. Another danger and source of loss of efficiency in the system is the leakage in and around the surface contacts during the time the cir-
45 cuits are completed to said contacts by reason of accumulation of dirt, foreign matter, dampness, or water collecting in and around such contacts. In order to avoid these ob-
50 jections, I provide in the roadway at points where the surface contacts are located a box or casing A^2 in which are located the sup-
55 ports for the surface contacts, the lever H of the main or supply branch E , and the elec-
60 tromagnet M of the corresponding auxiliary branch E' . This box or casing A^2 may be arranged, as shown, in a suitable seat pre-
65 pared therefor in the road-bed and suitably bolted to the tie C^2 and having its top flush with the surface of the road-bed. The top of the box or casing A^2 is provided with an en-
larged opening B^2 therethrough, adapted to receive the contact E^2 , which is arranged to project slightly above the top surface of the box or casing A^2 . The contact E^2 is of smaller size than the opening B^2 , whereby a passage is provided all the way around said contact
and between the same and the walls of the opening through the top of the box or casing A^2 . I have shown a simple and efficient man-

ner of mounting the contact E^2 , whereby said contact is thoroughly insulated and wherein I suitably bolt or otherwise secure a standard
70 D^2 to the floor of the casing or box A^2 and mount on the upper end thereof the contact. This contact is preferably in the form of an inverted bell, which may be filled with cement or other suitable insulating material F^2 , in
75 which is embedded the upper or free end of the standard D^2 , as clearly shown in Fig. 1. The inverted-bell-shaped contact E^2 may be of any suitable conducting material and is in electrical connection with its corresponding
80 branch conductor.

From the foregoing description it will be seen that I provide an exceedingly simple construction wherein the surface contact is
85 entirely surrounded by an air-space, thus avoiding leakage when the circuit is completed thereto and wherein any water which might be deposited on the road-bed by rain or otherwise will readily pass through the
90 opening B^2 and into the casing or box A^2 and from thence through a suitable passage G^2 , leading from the bottom of such casing into a convenient sewer H^2 . Thus a drain is pro-
95 vided whereby the water is conducted off the road-bed, and hence all danger of establish-
ing a circuit between adjacent contacts in the series of branch auxiliary conductors or from a live main supply-contact is entirely avoided.

While I have shown and described the
100 present invention as applied to surface contacts of the main or supply branches, it is to be understood that the same construction may be applied to the surface contacts J^2 of the
105 auxiliary branches, as indicated in Fig. 1. Specific and detailed illustration thereof, however, is omitted herein since the construction is the same as that above described.

The supply-conductor and also the wires forming the auxiliary circuit may be carried
110 in underground conduits or casings K^2 in the usual manner, as shown.

If desired, the boxes or casings A^2 may be provided with manholes covered by the usual removable coverings L^2 , whereby access may
115 be readily had to the said box or casing.

Having now set forth the object and nature of my invention and an embodiment of the principles thereof, what I claim as new and
120 useful and of my own invention, and desire to secure by Letters Patent of the United States, is—

1. In an electric-railway system a road-bed, a box or casing arranged therein and having an opening in the top thereof and a surface
125 contact of smaller size than said opening, and arranged to project therethrough, in combination with a circuit for said contact, and means carried by the car for completing the circuit through said contact, as and for the
130 purpose set forth.

2. In an electric-railway system a road-bed, a box or casing arranged therein and having the top thereof flush with the surface of the

road-bed, an opening being formed in the top of said box or casing, in combination with an insulated contact arranged to project through but of smaller size than said opening, a circuit including said contact and means for completing the circuit through said contact, as and for the purpose set forth.

3. In an electric-railway system a road-bed, a sewer or drain pipe, a box or casing arranged in said road-bed and in communication with said sewer or drain pipe, the top of said box or casing having an opening therein, a contact of smaller size than said opening arranged to project therethrough, a circuit for said contact and means for completing said circuit through said contact, as and for the purpose set forth.

4. In an electric-railway system a road-bed, a box or casing mounted thereon, a sewer or drain pipe with which said box or casing communicates, an opening in the top of said box or casing, a standard mounted in said box or casing in line with said opening, a contact mounted thereon and arranged to project through said opening, a circuit for said contact and means for completing the circuit through said contact, as and for the purpose set forth.

5. In combination a road-bed, a drain or sewer, a box or casing communicating therewith, a contact mounted in said box or casing but insulated therefrom, and arranged to project through the top thereof and out of contact therewith, a circuit including said contact, and means for completing said circuit

through said contact, as and for the purpose set forth.

6. In combination, a road-bed, a box or casing having an opening in the top thereof, a sewer or drain pipe with which said box or casing communicates, a standard mounted in said box or casing in line with said opening, a contact mounted thereon but insulated therefrom, and arranged to project through said opening, said contact being of smaller size than said opening, a circuit including said contact and means for completing said circuit through said contact, as and for the purpose set forth.

7. In combination, a road-bed, a box or casing having an opening in the top thereof, a sewer or drain pipe with which said box or casing communicates, a standard mounted in said box or casing in line with said opening, an inverted-bell-shaped contact mounted on standard, said contact being of smaller size than said opening and arranged to project therethrough, a circuit including said contact and means carried by the car for completing the circuit through said contact, as and for the purpose set forth.

In witness whereof I have hereunto set my hand, this 2d day of July, 1897, in the presence of the subscribing witnesses.

SIDNEY HOWE SHORT.

Attest:

M. A. KENSINGER,
JOHN J. BEVER.