

No. 788,280.

PATENTED APR. 25, 1905.

L. W. PULLEN.
ELECTRIC RAILWAY.
APPLICATION FILED JULY 18, 1904.

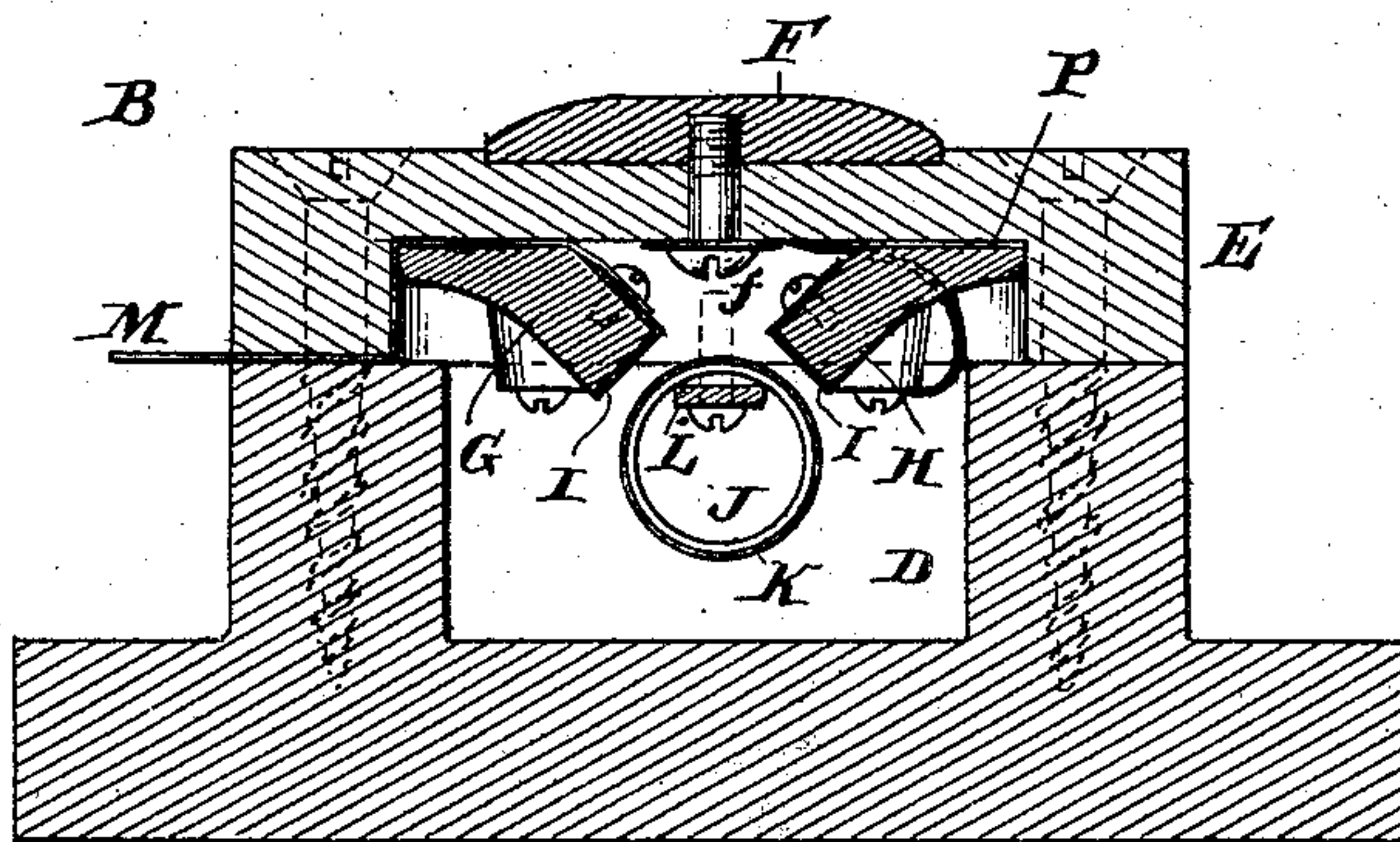
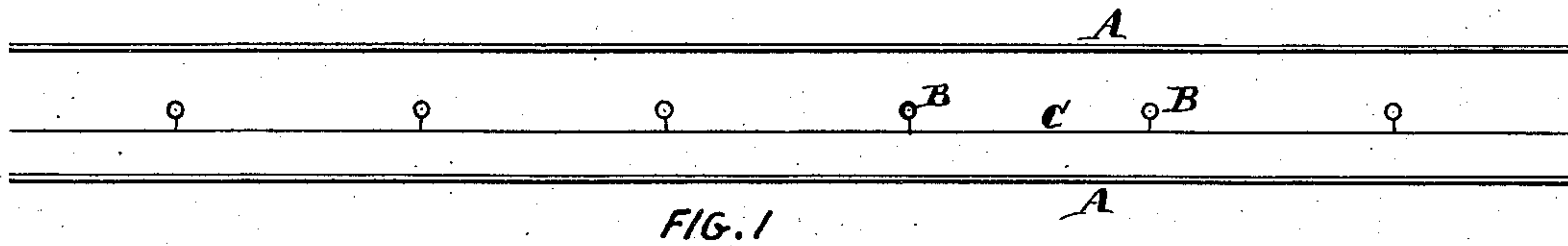


FIG. 2

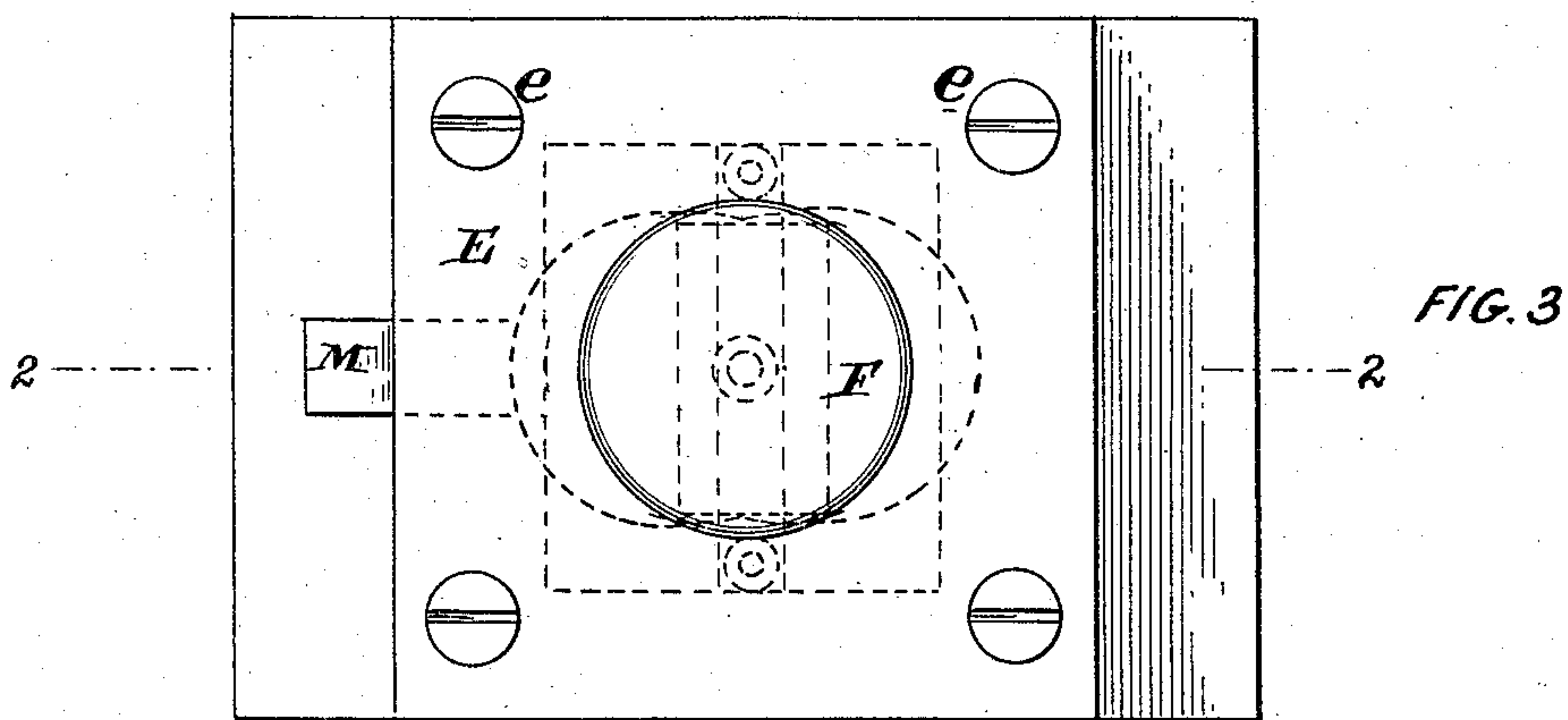


FIG. 3

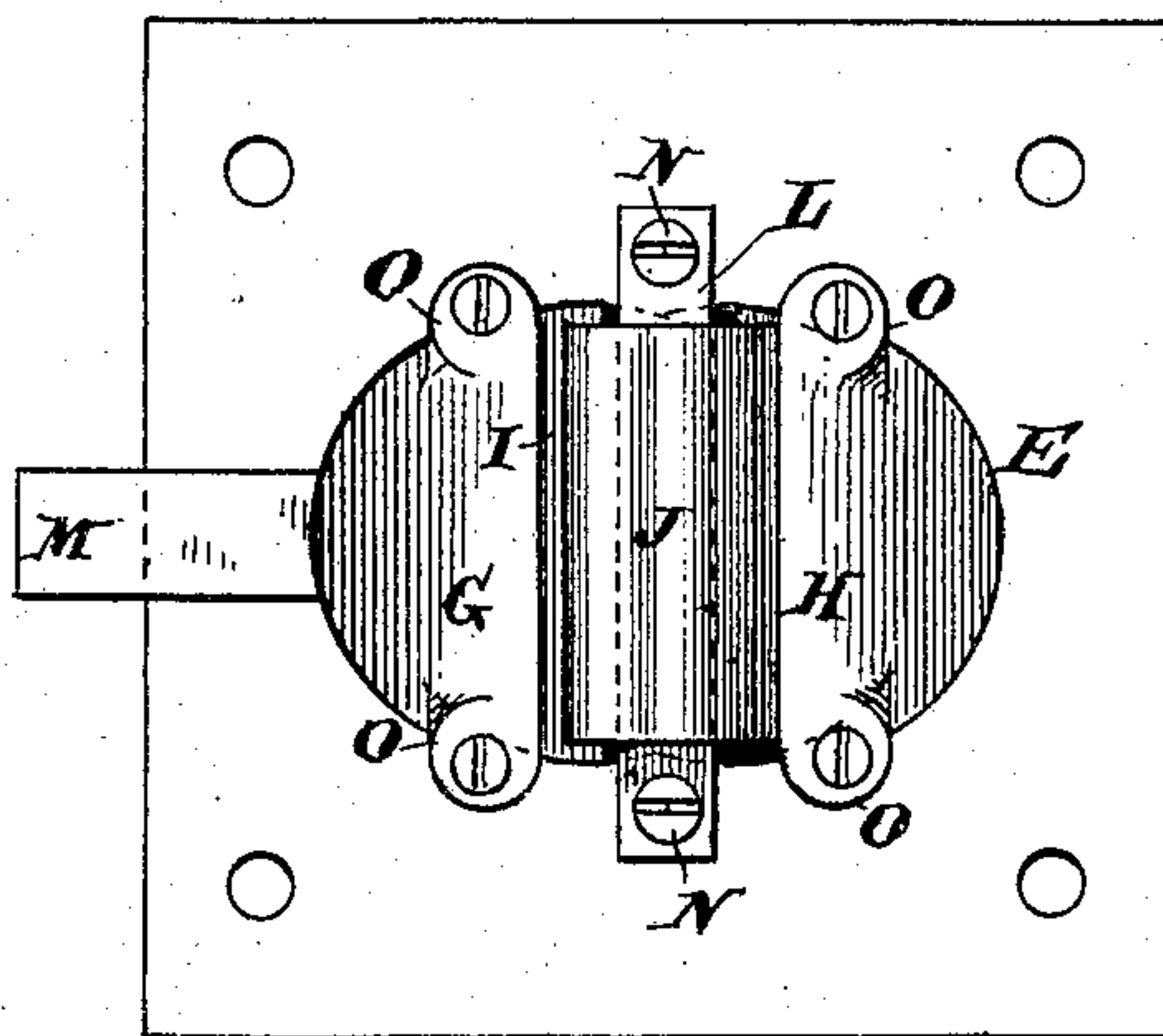


FIG. 4

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By his atty
[Signature]

UNITED STATES PATENT OFFICE.

LEON W. PULLEN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
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ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 788,280, dated April 25, 1905.

Application filed July 18, 1904. Serial No. 216,984.

To all whom it may concern:

Be it known that I, LEON W. PULLEN, of the city and county of Philadelphia, State of Pennsylvania, have invented an Improvement
5 in Electric Railways, of which the following is a specification.

My invention has reference to electric rail-
ways; and it consists of certain improvements
which are fully set forth in the following
10 specification and shown in the accompanying
drawings, which form a part thereof.

The object of my invention is to provide a
construction of circuit-closing switches
adapted to be arranged along the railway for
15 supplying current from a supply-conductor
to the car during its travel on the railway,
which shall be simple in construction, posi-
tive in action, and embodying durable char-
acteristics.

20 My invention comprehends a suitable box
or case containing on the upper part a con-
tact adapted to form an electrical connection
with the current-collector on the traveling
car, two contact-pieces within the box and
25 shielded thereby, and a tubular armature nor-
mally out of contact with said contact-pieces,
but adapted to be raised by a magnet on the
car to close the circuit between the contact-
pieces, and thereby form an electrical connec-
30 tion between a supply-conductor and the con-
tact-block on the top of the case or box, the
said supply-conductor being electrically con-
nected with one of the contact-pieces and the
contact-block being electrically connected
35 with the other of said contact-pieces.

My invention also includes details of con-
struction which, together with the above-
specified features, will be better understood
by reference to the drawings, in which—

40 Figure 1 is a plan view of an electric railway
adapted to the employment of my invention.
Fig. 2 is a sectional elevation on line 2 2 of
Fig. 3, showing my improved circuit-closing
switch. Fig. 3 is a plan view of same; and
45 Fig. 4 is an inverted plan view of the upper
part of the case, showing the operative parts
of my improved circuit-closing switch.

In Fig. 1, A represents the rails, B the con-

tact and switch boxes arranged at intervals
along the railway, and C is the supply-con- 50
ductor.

D is the lower box structure, and E is the
cover or cap thereof. Secured to the top of
the cap is the contact-block F, which is pref-
erably circular in plan and slightly curved 55
from the top toward the periphery and is
secured in position by means of a screw *f*,
extending through the cover or cap, as shown.
This contact-block is preferably made of man-
ganese steel, which has great durability and 60
resistance to wear and is also non-magnetic.

G H are two contact-pieces formed of metal
and are set into a recess in the under side of
the cover or cap, being held therein by means
of screws passing through said lugs O. These 65
two contact-pieces are separated a short dis-
tance and their opposing edges are beveled
to form, in effect, a V opening from the bot-
tom. These surfaces may be faced with cop-
per, as at I, to make a better electrical con- 70
nection with the tubular magnetic armature
J, which latter is also preferably covered with
copper, as at K. The armature is very light
and is held in a suspended position below the
contact-surfaces by means of a transverse bar 75
L, secured at each end by screws N to the cap
or cover. In my preferred form I place this
transverse bar L slightly nearer to one of the
contact-surfaces I than to the other, so that
when the tubular armature is allowed to fall 80
away from the contact-surfaces one side
strikes the transverse bar before the other, so
that in the settling of the armature it receives
a slight rotation. In this manner the arma-
ture is constantly shifting, and thereby pre- 85
sents new surfaces to the contacts G H with
each operation. From this it will be seen
that the armature is caused to wear uniformly
throughout its entire circumference and is
therefore more durable with a given lightness 90
than it would otherwise be if the same place
of contact always came into play.

One of the contact-pieces, H, is electrically
connected with the contact-block F by means
of the flexible wire P, and the other of said 95
contact pieces, G, is connected by a copper

strip M with a conductor leading to the supply-conductor C, said copper strip extending through the case or box at the juncture of the lower body or box and the cap or cover.

5 The cap or cover is held in place by suitable screws *e*. The case may be of wood properly saturated with an insulating material, such as asphaltum or shellac or any other insulating substance. The case may be made of any
10 other material so long as the contact parts are properly insulated. It is also evident that while I have shown the contact-block as secured to the top of the cover it is immaterial that it should be directly secured thereto, as its
15 position in the railway may be considerably varied; but the circuit-closing switch comprising the parts G H J must be so located along the railway that magnets upon the car will in passing operate to draw up the armature and
20 close the circuit through the contact-pieces G H, substantially as set out in Letters Patent No. 749,401, granted to me on January 12, 1904.

The details of construction may be modified without departing from the spirit of the invention.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

30 1. In an electric railway, a circuit-closing-switch box consisting of the combination of contact-block for supplying current to the collector of the car, two contact-pieces one of which is electrically connected with the contact-block and the other with a source of
35 electric energy and said contact-pieces having opposing faces slightly separated, a tubular armature of magnetic material adapted to be raised and form an electrical connection between the two contact-pieces, and a transverse support upon which the tubular armature is loosely hung.

2. In an electric railway, a circuit-closing-switch box consisting of the combination of
45 contact-block for supplying current to the collector of the car, two contact-pieces one of which is electrically connected with the contact-block and the other with a source of electric energy and said contact-pieces having opposing faces slightly separated and located
50 nearer one of the contact-pieces than the other so that when the armature falls it is given a slight rotary motion, a tubular armature of magnetic material adapted to be raised and

form an electrical connection between the two 55 contact-pieces, and a transverse support upon which the tubular armature is loosely hung.

3. In an electric railway, a circuit-closing-switch box consisting of the combination of contact-block for supplying current to the collector of the car, two contact-pieces one of which is electrically connected with the contact-block and the other with a source of electric energy and said contact-pieces having opposing faces slightly separated and having inclined surfaces covered with copper and constituting a V-opening, a tubular armature of magnetic material adapted to be raised and form an electrical connection between the two contact-pieces and having its circumference
70 coated with copper, and a transverse support upon which the tubular armature is loosely hung.

4. In a circuit-closing-switch box for an electric railway, the combination of a case, two contact-pieces arranged within the case and slightly separated so as to form a longitudinal slit between them and two opposing contact-surfaces, a tubular armature of magnetic material adapted to rise and fall to close the circuit between the contact-pieces, and a transverse support extending into both ends of the tubular armature to hold it loosely in position below the contact parts and permit it to rise sufficiently to close the circuit between the
85 contact-pieces.

5. In a circuit-closing-switch box for an electric railway, the combination of a case, two contact-pieces arranged within the case and slightly separated so as to form a longitudinal slit between them and two opposing contact-surfaces, a tubular armature of magnetic material adapted to rise and fall to close the circuit between the contact-pieces, and a transverse support extending into both ends of the tubular armature to hold it loosely in position below the contact parts and permit it to rise sufficiently to close the circuit between the contact-pieces and said support being arranged nearer the one of the contact-surfaces than to the other so as to cause a slight rotation to the armature when it falls.

In testimony of which invention I hereunto set my hand.

LEON W. PULLEN.

Witnesses:

R. M. KELLY,
WM. ROONEY.