

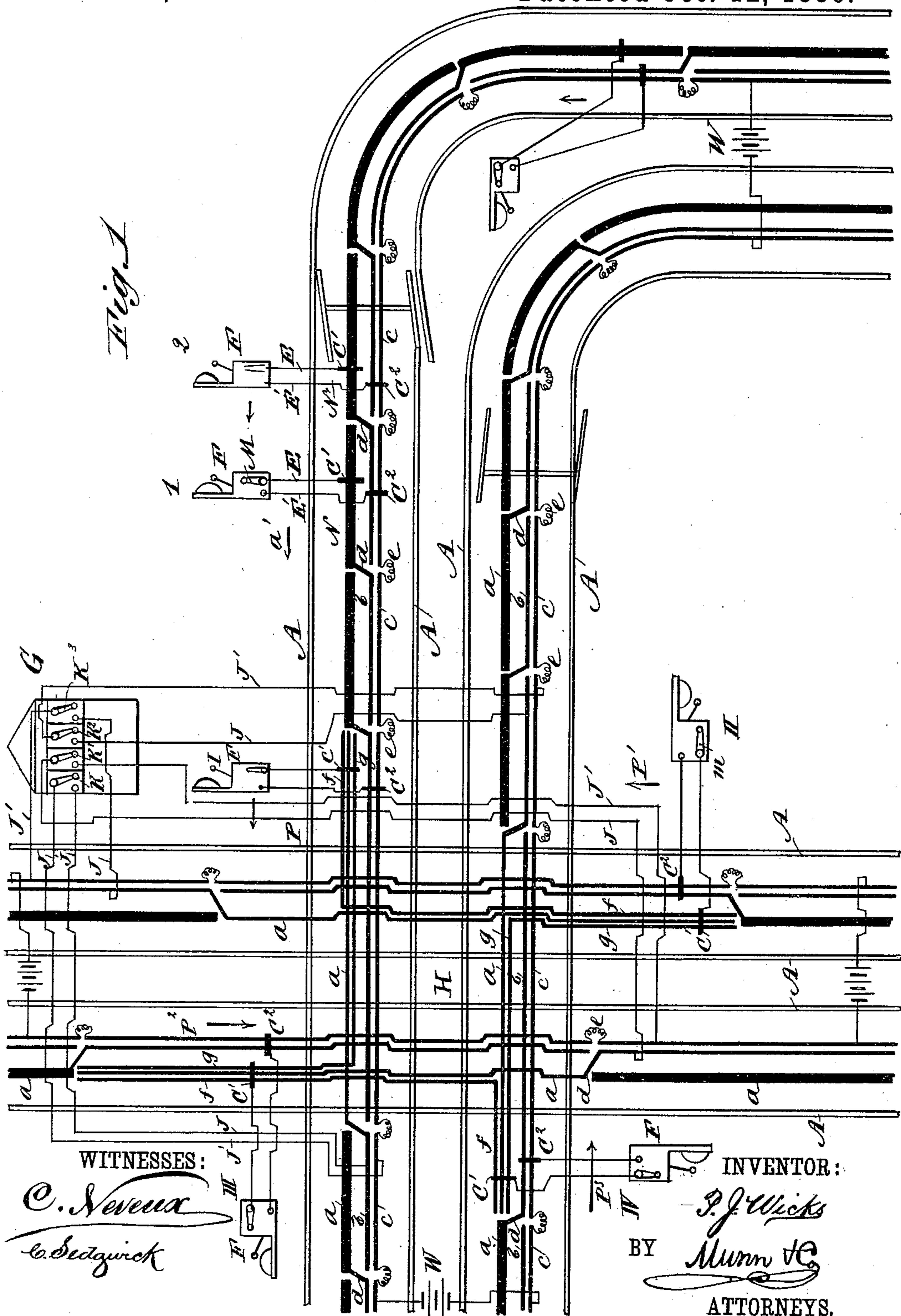
(No Model.)

2 Sheets—Sheet 1.

P. J. WICKS.
RAILWAY SIGNAL.

No. 350,790.

Patented Oct. 12, 1886.



N. PETERS. Photo-Lithographer. Washington, D. C.

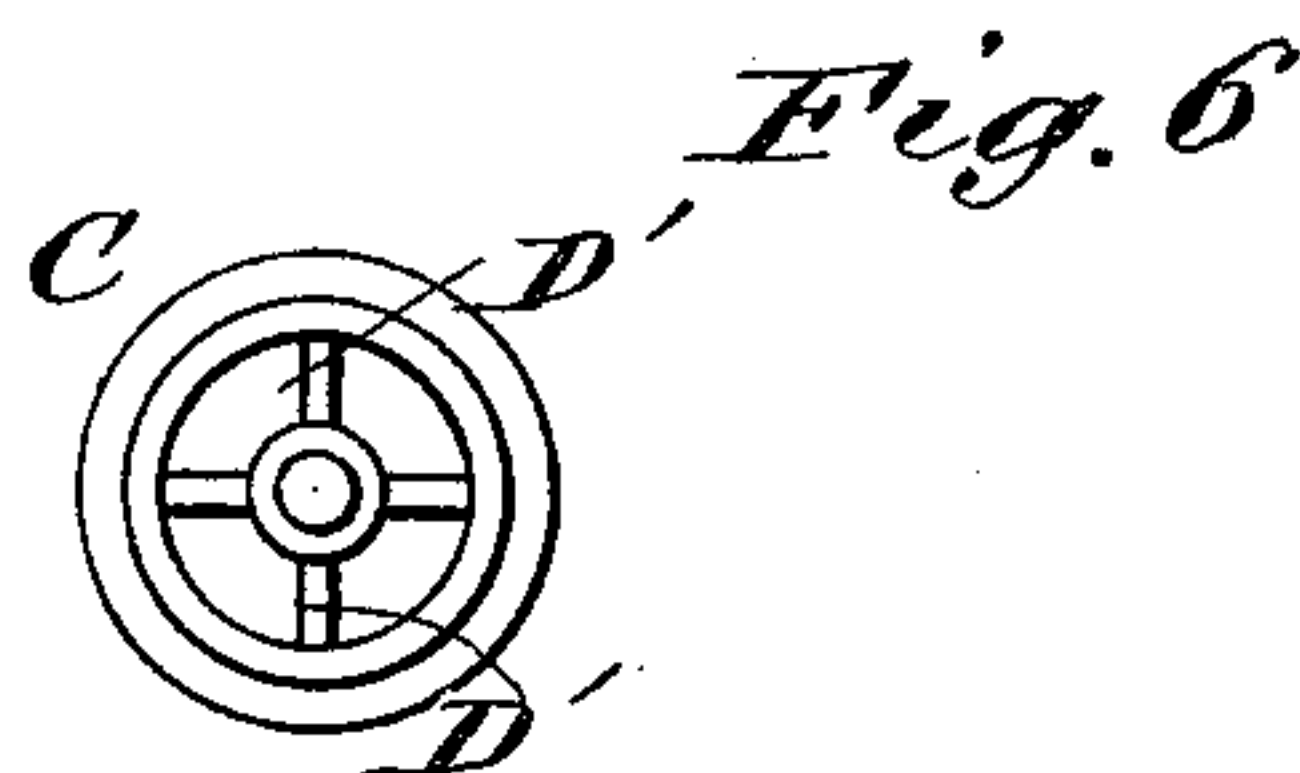
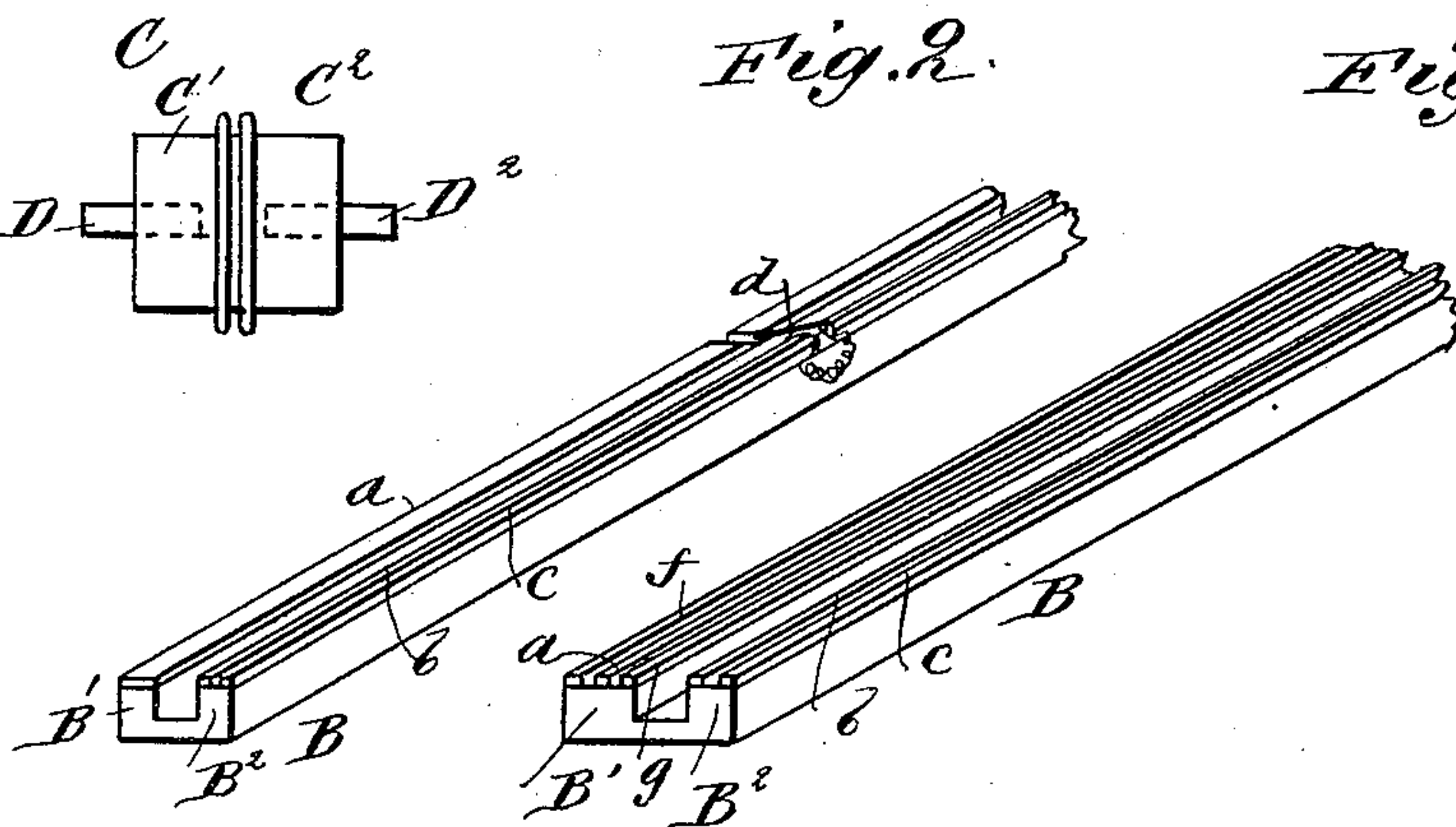
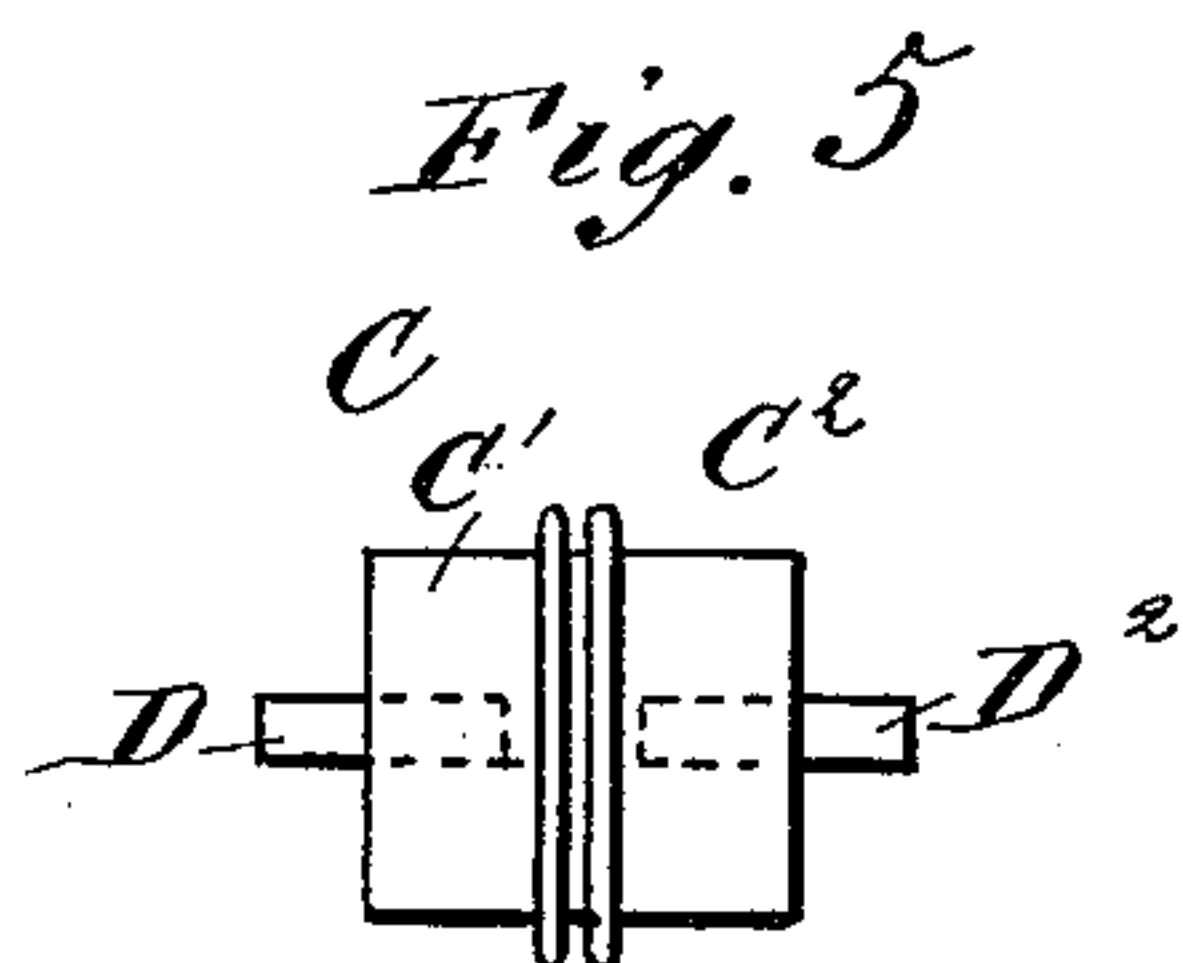
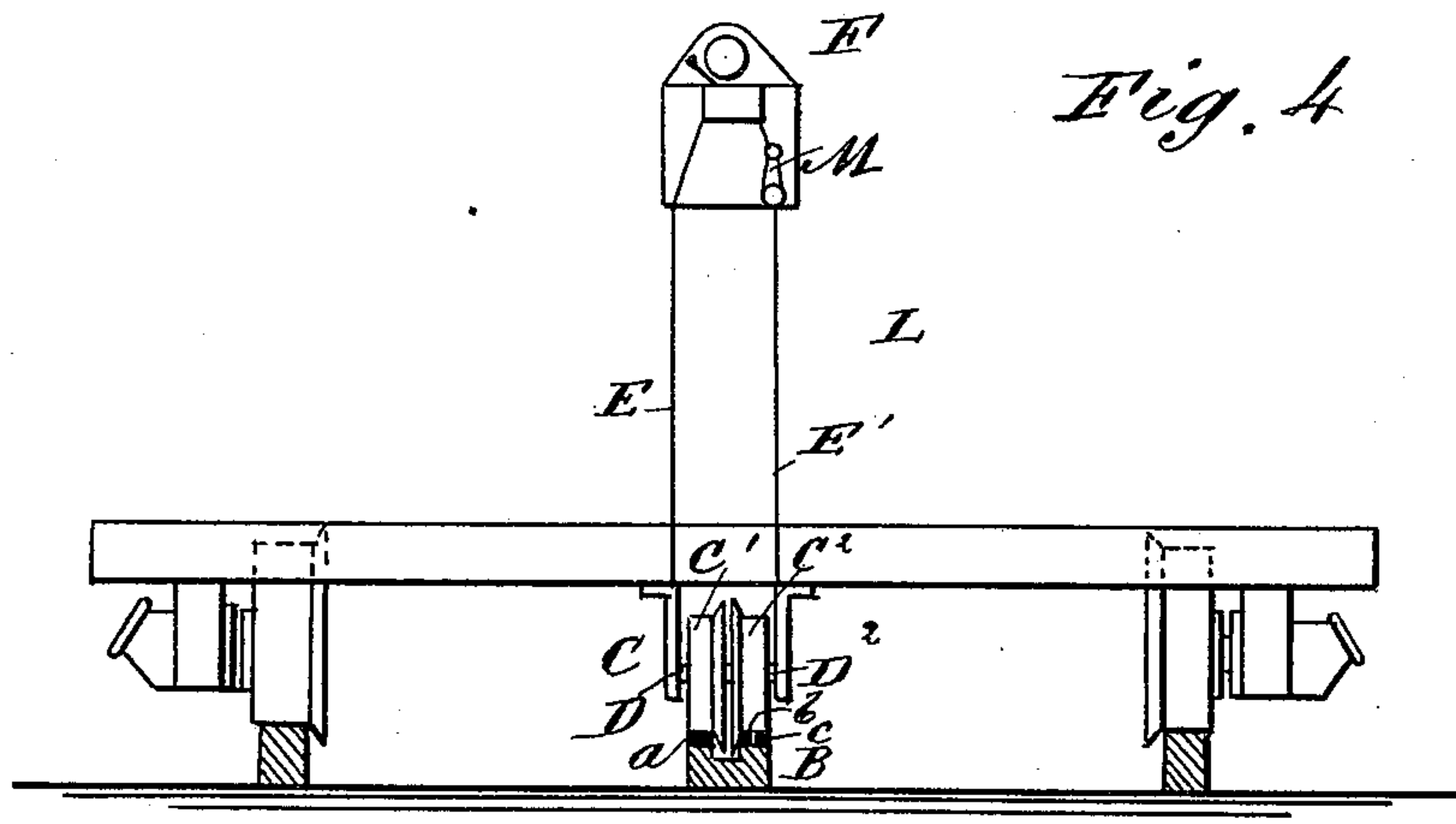
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UNITED STATES PATENT OFFICE.

PIERSON J. WICKS, OF GREEN POINT, NEW YORK.

RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 350,790, dated October 12, 1886.

Application filed March 24, 1886. Serial No. 196,378. (No model.)

To all whom it may concern:

Be it known that I, PIERSON J. WICKS, of Green Point, in the county of Kings and State of New York, have invented a new and Improved Electric Signal for Railway-Block Systems, of which the following is a full, clear, and exact description.

The object of my invention is to provide new and improved electric signals for railway-block systems, which signals are sounded in the cabs of the locomotives.

The invention consists in the arrangement for sounding automatically a bell in the cab of a locomotive as soon as two or more trains are on adjoining sections or at a crossing, and in the arrangement by which an engineer in a locomotive can ascertain at any time whether the opposite section of crossing is free or occupied.

The invention also consists of various parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view showing my improvement. Fig. 2 is a perspective view of part of a string-piece provided with my conductors. Fig. 3 is a similar view of a string-piece on a crossing. Fig. 4 is a vertical cross-section of a railroad-track, showing my improvements. Fig. 5 is a side elevation of the contact-wheel. Fig. 6 is an end view of the same.

Between the rails A A of each track is placed and attached to the sleepers a string-piece, B, of wood, compressed paper, or of any other suitable material, which is provided with two raised parts, B' and B², of which the part B' is covered on its upper edge with a conductor, a, and the part B² has two conductors, b and c, on its top. These conductors a, b, and c are metallic strips insulated from the parts B' and B² of the string-piece B by any suitable insulating material. The string-pieces B are joined to form a section of any desired length. At the junctions of the several sections the conductors from one section are insulated from the corresponding conductors of the following section; but the conductor b of one section is connected by a metallic strip

or conductor, d, with the conductor a of the following section. c is the main conductor, through which passes a current of electricity supplied from a central station by means of a dynamo-machine or a battery, W. A resistance-coil, e, is placed in a recess formed in the ends of the adjoining sections, and connected with the adjoining conductor c, opposite the connecting-piece d in each and every section. The resistance-coil e offers a greater resistance to the current of electricity than the electric alarm F in the cab L of the locomotive.

The contact-wheel C is provided with two metallic tires, C' and C², which are insulated from each other, and of which the tire C' is connected with the trunnions D by the metallic strip D', and the tire C² is similarly connected with the other trunnion, D², by similar strips D'. The contact-wheel C is mounted in suitable bearings attached to the locomotive, and provided with springs which hold the wheel C in contact with the conductors a, b, and c of the string-piece B, whereby the contact-wheel is rotated. The tire C' is in connection with the conductor a, and the tire C² is in connection with the conductors b and c. From each trunnion D and D² passes a wire, E and E', respectively, to the cab L of the locomotive, and connects with the electric alarm F, placed in the said cab in the usual manner. Instead of having one contact-wheel C with separate tires, two independent wheels may be employed for the same purpose and with the same advantage.

At a railway-crossing the conductor a is narrowed down to such an extent as to permit two additional conductors, f and g, to be placed on the top of the part B' of the string-piece B, alongside of the conductor a, and running parallel with the same, as shown in Figs. 1 and 3, the conductors f and g of one section connected with the respective conductors f and g of the crossing-section, while the conductor a remains the same as on the straight track. The conductors which do not connect with each other, but cross each other, are insulated from each other at their respective crossing-points.

A switch-tower, G, is placed near the crossing H, and is provided with a number of switches, K, K', K², and K³, each of which connects two wires, J and J', leading to each

section, and connected with the conductors *b* and *c*, respectively.

The operation is as follows: It will be seen that the main conductor *c* is supplied with a continuous current of electricity from the battery *W*, or other source of supply in the central station, and the resistance-coil *e* is gaged to offer a greater resistance to the electric current than the alarm mechanism *F* in the cab of the locomotive, so that when two locomotives occupy adjacent sections the greater part of the current of electricity passes through the alarm *F*, instead of passing through the resistance-coil *e*. When the locomotive 1 is on the section *N*, and locomotive 2 is on the following section, *N'*, then a branch circuit is established between the two locomotives 1 and 2, which circuit offers a resistance somewhat less than the resistance of the coil *e* which is between the two locomotives, so as to cause the bell or alarm *F* in the locomotive 2 to ring, and thereby warn the engineer that the preceding section *N* is occupied. The above-mentioned branch circuit is established by the current of electricity passing from the main conductor *c* to the locomotive 2 by means of the tire *C*² of the contact-wheel *C*, to the metallic strip *D'*, the trunnion *D*², the wire *E'*, the alarm *F*, and then the current passes down the wire *E* to the tire *C'* and to the conductors *a*, and from the same by the next metallic strip *D* to the conductor *b* of the section *N*, and back to the conductor *c* by the tire *C*² of the contact-wheel *C* of the locomotive 1 on the section *N*. Thus it will be seen that the bell of the locomotive 2 rings, while the bell of the locomotive 1 is not disturbed on account of not being in the circuit when the train approaches from the rear, and the bell of the locomotive 2 continues ringing until the connection between the conductors *b* and *c* in section *N* is broken—that is, when the locomotive 1 has left the section *N* in the direction of the arrow *a'*. When the four trains *I*, *II*, *III*, and *IV* arrive simultaneously at the last sections, *P*, *P'*, *P*², and *P*³, respectively, before the crossing, as shown in Fig. 1, the alarm *F* in the cab *L* of each locomotive commences to ring as the connection is established by the tire *C'* of the contact-wheel *C* of each locomotive covering the three conductors *a*, *f*, and *g*, and the conductors *f* and *g* of section *P* connect with the conductors *f* and *g* of the sections *P'* and *P*³, thereby causing the ringing of the alarms *F* of locomotives 2 and 3, and the conductors *f* and *g* of the section *P*³ connecting with the conductors *f* and *g* of the sections *P'* and *P*² cause the bells of the four locomotives to ring simultaneously. The object of the conductors *f* and *g* is to prevent receding trains from affecting the alarms of trains approaching the crossing. If the train *I* is on section *P* and train *II* enters section *P'*, then the bells of both locomotives will ring, as a connection is established between the alarms *F* of both locomotives by the tires *C'* of the contact-wheel *C* of both locomotives 1 and 2 covering the conductor *f* of the sec-

tions *P* and *P'*, and both tires *C*² covering, respectively, the conductors *b* and *c* of the sections *P* and *P'*, so that a circuit is established in the same manner as above described in relation to the locomotives 1 and 2 on sections *N* and *N'*. Now, if train *I* has the right of way, it is so understood by the engineer in charge of locomotive 2, and he can signal to the engineer of locomotive 1 to advance by placing the switch *M*, connected with the alarm *F*, so as to break the circuit, whereby the bell of the locomotive 1 will cease to ring, which is the signal to the engineer of the train to pass over the crossing. As soon as the train *I* has left the crossing, the engineer of locomotive 2 returns the switch *M* to its normal position, and if the alarm *F* remains silent he can pass over the crossing in safety, as no locomotive is on any section connected with the crossing.

An approaching train may be signaled from the tower *G* on one of the four sections leading to the crossing, by turning the respective switch so as to connect its wires leading to the conductors *b* and *c*. By this means a switchman wishing to signal train *III*, for instance, connects wires *J* and *J'*, leading to the conductors *b* and *c* of the section *P*², by the switch *K*, so as to establish a current between the conductors *b* and *c* of the section *P*² and the alarm *F* in train *I*.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In an electric signal for a block system for railways, a string-piece provided with three conductors, *a*, *b*, and *c*, for every block or section of the track, of which the conductor *a* connects with the conductor *b* at the end of every section, and of which the conductor *c* of one section is connected with the corresponding conductor *c* of the following section by a resistance-coil, substantially as shown and described.

2. In an electric signal for a block system for railways, a string-piece provided with five conductors, *a*, *b*, *c*, *f*, and *g*, at every crossing of the railway, of which the conductors *f* and *g* of one track connect with the corresponding conductors *f* and *g* of the crossing-track, substantially as shown and described.

3. In an electric signal for a block system for railways, the combination of a string-piece provided with three conductors, *a*, *b*, and *c*, for every block or section of the track, of which the conductor *a* is connected at the end of every section by the connection *d* with the conductor *b*, and of which the conductor *c* at the end of every section is connected with the corresponding conductor *c* of the following section by a resistance-coil, *e*, with a contact-wheel attached to the locomotive and provided with two tires insulated from each other, and an alarm in the cab of the locomotive electrically connected with the tires of the said contact-wheel, substantially as shown and described.

4. In an electric signal for a block system for railways, the combination of a string-piece

provided with three conductors, *a*, *b*, and *c*,
for every block or section of track, of which
the conductor *a* is connected at the end of every
section with its corresponding conductor, *c*, of
5 the following section by a resistance-coil, *e*,
with a contact-wheel attached to the locomotive
and provided with two tires insulated from
each other, an alarm in the cab of the locomotive
electrically connected with the tires of the
10 contact-wheel, and a switch between the electrical
connections of the alarm and the contact-wheel,
substantially as shown and described.

5. In an electric signal for a block system
for railways, the combination of a string-piece,
15 B, provided with five conductors, *a*, *b*, *c*, *f*, and
g, at every crossing of the railway, with a string-piece,
B, provided with three conductors, *a*, *b*,
and *c*, of which the conductor *a* is connected

by the conductor *d* with the conductor *b* of the
crossing, and the conductor *c* is connected with 20
the conductor *c* of the crossing by a resistance-coil,
e, substantially as shown and described.

6. In an electric signal for a block system
for railways, the wires J and J', and the switches
K, K', K², and K³, connecting, respectively, 25
with the said wires, in combination with a
string-piece for each track at a crossing, said
string-piece being provided with the conductors
a, *b*, and *c*, of which conductors *b* and
c connect, respectively, with the said wires J 30
and J', substantially as described.

PIERSON J. WICKS.

Witnesses:

L. W. EBELL,

CHARLES J. HOWELL.