

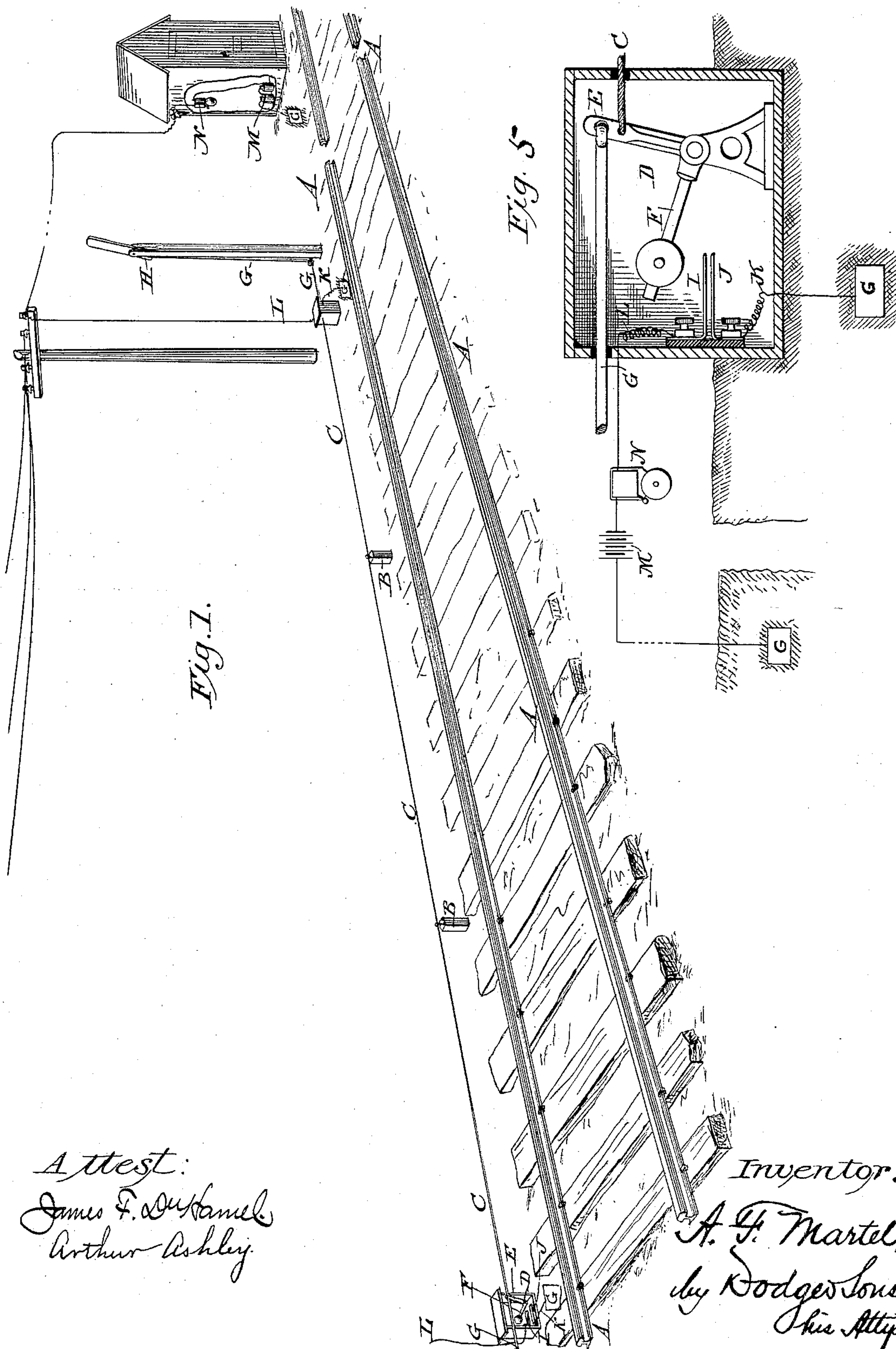
(No Model.)

2 Sheets—Sheet 1.

A. F. MARTEL.
RAILWAY SIGNAL.

No. 385,677.

Patented July 3, 1888.



Attest:
James F. Duhamel
Arthur Ashley.

Inventor:
A. F. Martel,
by Dodge & Sons,
His Atty.

(No Model.)

2 Sheets—Sheet 2.

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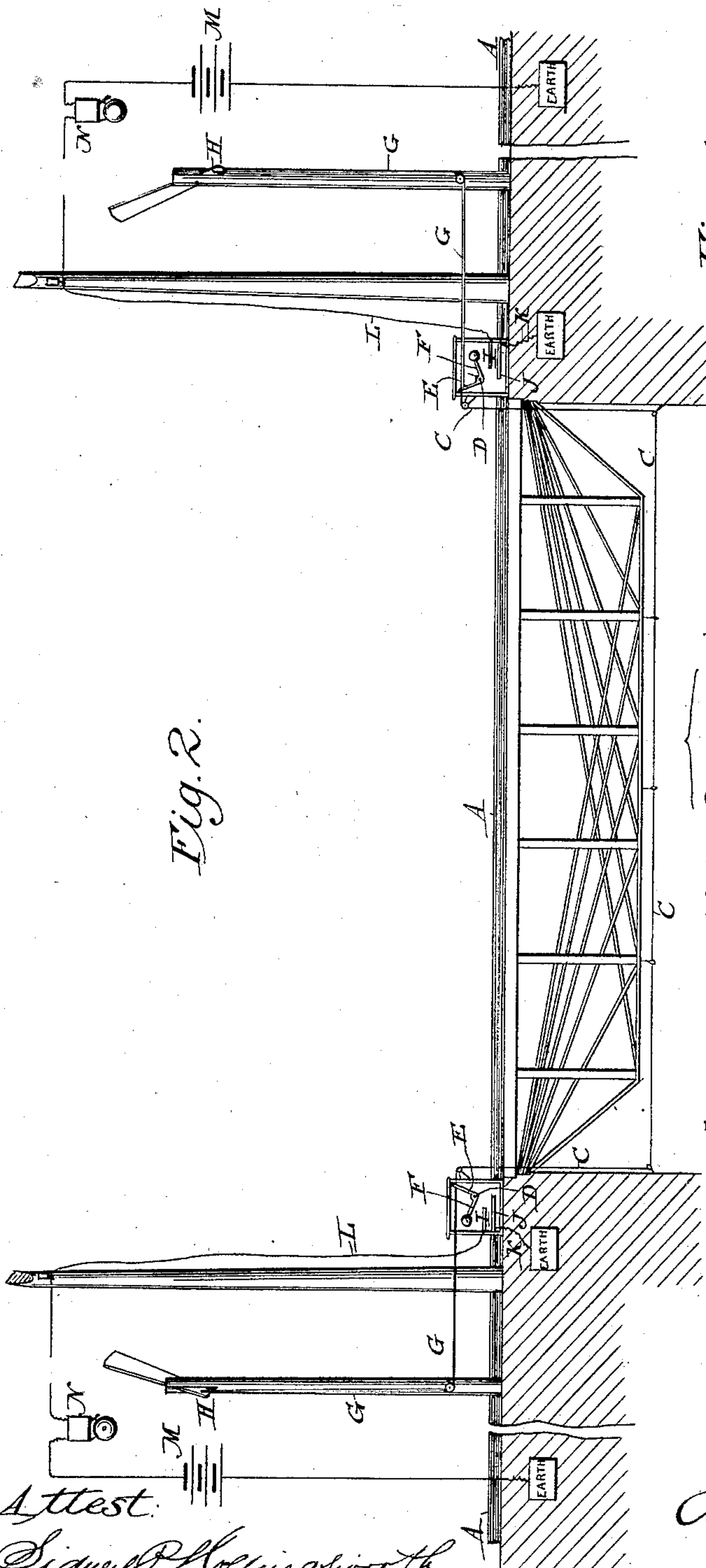


Fig. 2.

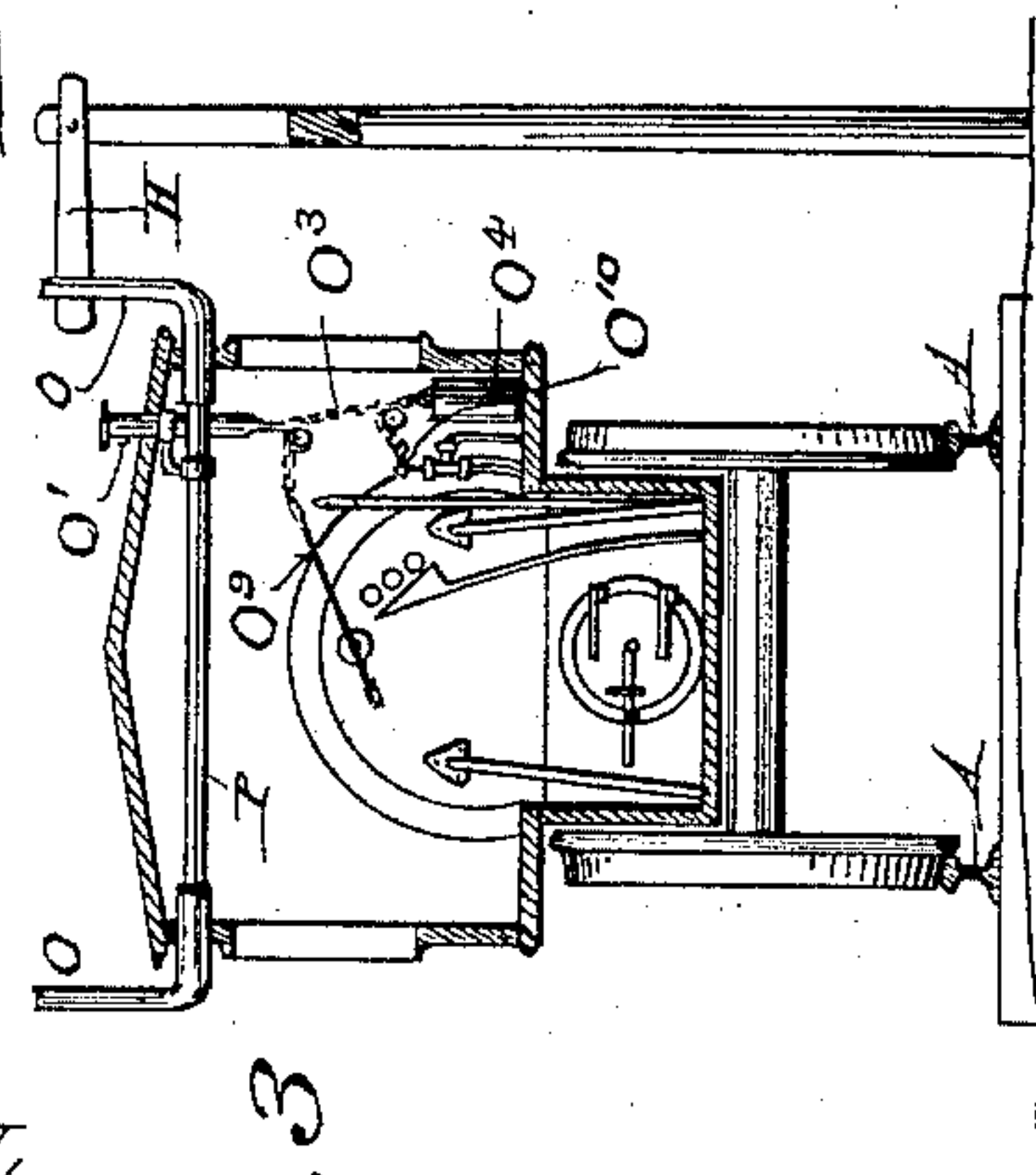
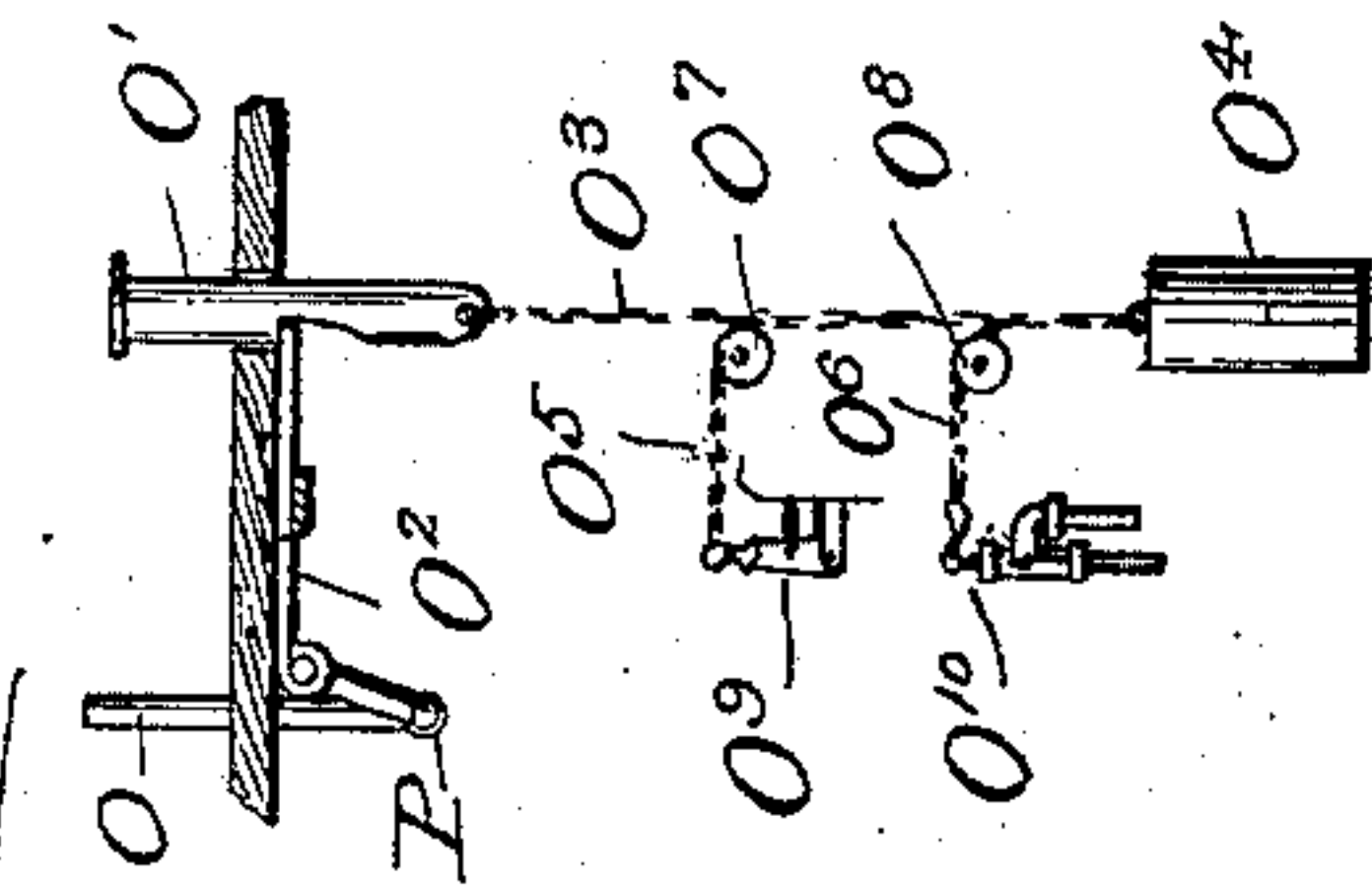
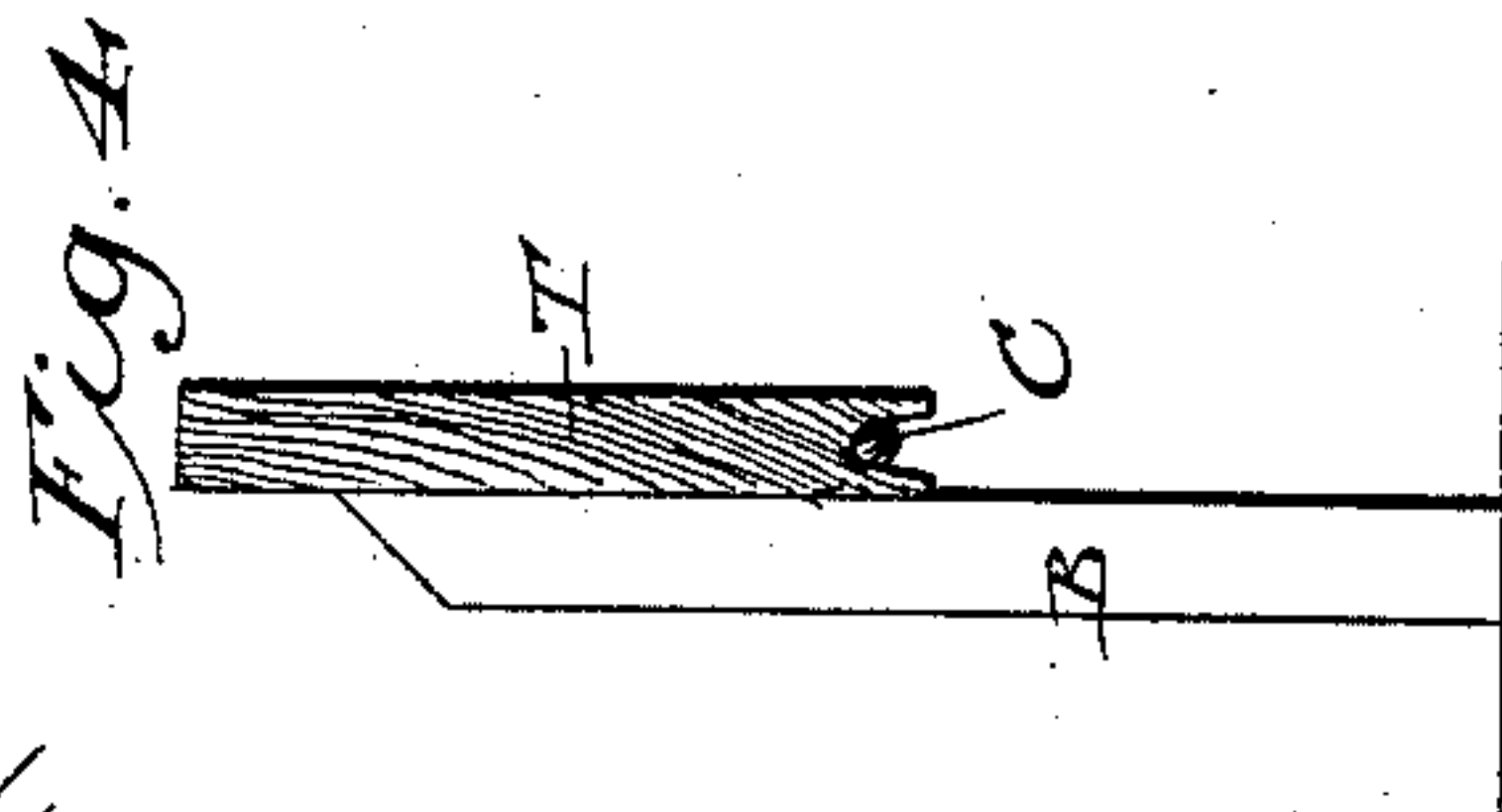


Fig. 3.

Attest:
Sidney P. Hollingsworth
James F. Duhamel

Inventor:
Adelard F. Martel,
by Dodge & Sons,
his Attys.

UNITED STATES PATENT OFFICE.

ADELARD FRANCIS MARTEL, OF MONTREAL, QUEBEC, CANADA, ASSIGNOR OF THREE-FOURTHS TO JEAN BAPTISTE AMEDE MONGENAI, OF RIGAUD, AND TOUSSAINT BROSEAU AND MARIE M. PHILOMIENE CRAIG, BOTH OF MONTREAL, QUEBEC, CANADA.

RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 385,677, dated July 3, 1888.

Application filed October 29, 1887. Serial No. 253,756. (No model.)

To all whom it may concern:

Be it known that I, ADELARD FRANCIS MARTEL, of Montreal, in the county of Hochelaga and Province of Quebec, Canada, have invented certain new and useful Improvements in Railway-Signals, of which the following is a specification.

My invention relates to railway signals, and is designed to warn the engineer of an approaching train, a station-master, or others in charge, of danger, where such exists.

My invention is designed, primarily, as a fire-alarm, so that in case the underbrush or trees adjacent to a track or the track itself should catch fire the train-men or others shall be notified at a distance at either side of the fire.

While the invention is applicable more particularly to giving an alarm where the track, or underbrush adjacent to the track, is liable to burn, it is equally applicable to bridges and snow-sheds, so that whether they burn or sag or fall, through defective workmanship, an alarm will be sounded at suitable distances at each side of the fire or other disturbance.

The invention also consists in a novel arrangement of devices by which, in addition to the signals or alarms heretofore referred to, the engineer of an approaching train is notified of the danger, the steam shut off, and the air-brakes applied to the train.

Referring to the accompanying drawings, Figure 1 is a perspective view of a railway-track provided with my improved signaling apparatus; Fig. 2, a view showing a bridge provided with my invention; Fig. 3, a rear view of a locomotive, showing the means by which the signal is automatically given to the engineer, and by which also the train is brought to a standstill; and Figs. 4 and 5, detail views.

A indicates a track, upon one or both sides of which I place, at suitable distances apart, posts B, which support a cord or other fusible or combustible connection, C, the cord or connection being stretched tight and connected at one or both ends with a circuit-closer, which will preferably be incased in a strong box and

fixed securely upon the ground or upon a post adjacent to the track.

The circuit-closer may consist simply of an elbow-lever, D, pivoted at the angle or bend, and comprising two arms, E and F. The upright arm E is connected with the cord or connection C, while the lower or horizontal arm, F, is weighted or provided with a weight at its outer end. Connected with the upright arm E is a strong wire or rod, G, which is connected with the arm H of a semaphore-signal, which may be located at any desired distance from either end of the track or bridge protected. This rod G, which is connected to the semaphore-arm, will be carried in posts having small rollers, as is now commonly done; and as the semaphore, *per se*, forms no part of the present invention, its construction need not be described.

Directly beneath the horizontal arm F of the elbow-lever or circuit-closer D are two contact arms or springs, I J, which are electrically insulated from each other. A wire, K, extends from arm J to the earth, while a wire, L, extends from arm I to a station at any suitable distance away from the track or bridge. The wire L is provided with a battery, M, and with an electric bell, N.

The semaphore-signal is located in proximity to the track, so that when its arm H is operated or thrown out at an angle to the post to which it is pivoted it shall be in position, so as to strike the upturned end O of a rock-shaft, P, journaled in the cab of the engine, as shown. Extending upward through the top of the cab is a sliding rod or bolt, O', with which a sliding latch, O'', connected with the rock-shaft, is adapted to engage, as clearly shown in Fig. 3. Secured to the lower end of the sliding rod O' is a cord or connection, O'', provided at its lower end with a weight, O'', and connected with the cord or connection O'' are similar cords, O'' and O'', passing, respectively, over wheels O'' O'', and connected at their ends with the throttle-valve O'' and the valve O'' of the air-brake mechanism. From this construction it will be seen that as soon as the arm H is thrown outward to indicate "danger"

it will be in such position as to strike the up-
turned end of the rock-shaft P, and as the end
O of the latter strikes against the arm H the
rock-shaft will be turned or rotated and the
5 latch O² withdrawn from the bolt O', thereby
permitting the weight O⁴ to fall. As the cord
or connection is thus pulled downward, acting
through the cords O⁵ and O⁶, connected, re-
spectively, with the throttle valve and the
10 valve of the air-brake mechanism, it operates
the latter, thereby shutting off the steam and
applying the air-brakes.

If desired, the rock-shaft may be arranged
in such manner as to sound an alarm upon the
15 cab; but as such mechanism is shown in Let-
ters Patent No. 229,048, issued to me June
22, 18-0, it is not deemed necessary to illus-
trate or describe it herein.

I am aware that the employment of com-
20 bustible cords as a means for automatically
giving an alarm in case of fire is not of itself
new.

The cord or connection C will advisably be
placed upon both sides of the track, as shown,
25 and where a single track is used I attach the
cords C at both ends to a circuit-closer, so as
to give a warning at each side of the point at
which the fire takes place.

In order to prevent the cord C from being
30 affected by water or being broken accidentally,
I seat it in a groove in the lower face or edge
of a board, T, carried by the posts B, as shown
in Fig. 4, and, if desired, the cord may be
coated with a highly inflammable substance to
35 render its burning more certain.

In Fig. 2 I have shown the invention as ap-
plied to a bridge, the same construction and
arrangement of circuit-closer being employed
in this case as in the case of a track.

40 A number of the cords C may be employed
upon a bridge and connected one with the
other, so that should the bridge burn or sag
unduly at any point it will cause an alarm to
be given, not only by means of the audible
45 signal at the station and the semaphore, but
will also operate the mechanism upon the lo-
comotive, so as to bring the train to a stand-
still.

The operation of this system is as follows:
50 Suppose that the underbrush, or the country
upon either side of the track, should be on
fire. As soon as the fire reaches the cords,
which are set at a greater or less distance away
from the track, the cord or connection will be
55 burned or severed. As soon as the cord is
thus severed, the weighted arm F of the el-
bow-lever or circuit-closer D strikes against
the plate or contact-finger I and throws the
same into contact with the arm or finger J, and
60 thereby establishing a circuit through the wire
K, arms J I, wire L, battery M, and bell N, the
bell, which is located at some distance from the
bridge or track, being rung as soon as the cir-
cuit is completed, thereby giving notice to the
65 station-master that there is fire adjacent to the
track or bridge. At the same time that the
circuit is completed and the elbow-lever or

circuit-closer D swings upon its pivot the rod
G, which is connected to the semaphore arm
H, also moves longitudinally, thereby permit- 70
ting the arm H to swing down horizontally
from the post or standard. The post or stand-
ard, which carries the semaphore-arm, may be
located at either side of the signal-bell, so that
in case there should be no one at the station 75
at the time that the alarm is given the engineer
will see the semaphore-arm in such position
as indicates "danger." In case, however, the
engineer should be asleep, or there should be
no one upon the engine to observe the posi- 80
tion of the semaphore-arm, this arm, striking
against the upwardly-turned end O of the rock-
shaft P, will not only operate the gong within
the cab of the locomotive, but will also shut
off the steam and apply the brakes, and thereby 85
bring the train to a standstill at a suitable dis-
tance from the point upon the track at which
the fire has occurred. The same operation
would take place if the bridge should burn or
fall or sag. 90

From the foregoing construction it will be
seen that every feature of the system is per-
fectly automatic, and in case the electric or
audible alarm or signal should not be observed
the mechanical signal will be positively actu- 95
ated.

If by constant travel over the bridge the lat-
ter should wear gradually, so as to weaken
sufficiently to render the bridge unsafe, it will
cause such a strain upon the cord or connec- 100
tions C as to give an alarm the same as if the
cord were burned.

To guard against the burning of the track,
I place a cord or connection, C, along between
the rails and resting upon the ties, and also, 105
if desired, upon the ties outside of the rails.

Snow-sheds, which are also liable to be set
afire by sparks or coals from the locomotive,
may be effectually protected.

I am also aware that a severable wire or elec- 110
tric conductor has been employed upon a
bridge in connection with a constant current,
so that upon the severing of the wire the cur-
rent will be interrupted and the signal-arma-
ture of an electro-magnet included in the cir- 115
cuit permitted to fall and be displayed. Last-
ly, I am aware that it is not broadly new to
bring into action automatically the stopping
mechanism of a train, and I make no broad
claim to such an idea. 120

Having thus described my invention, what
I claim is—

1. In a railway-signal, the combination, with
a bridge, track, or like structure, of a com-
bustible cord located in proximity thereto, a 125
circuit-closer connected with the cord, an au-
tomatic mechanically-operated semaphoric
signal, a non-electric connection between the
circuit-closer and the semaphoric signal, a nor-
mally-open electric circuit, and an audible sig- 130
nal included in the circuit, all substantially as
shown, whereby when the cord is severed the
circuit-closer is caused to complete the circuit
and sound an alarm, and at the same time

cause or permit the semaphoric signal to be displayed.

2. In a railway-signal, the combination, with a track, bridge, or like structure, of a combustible cord or connection located in proximity thereto, an elbow-lever to which said cord is connected, an electric circuit, contact-arms in the path of the elbow-lever, a bell or signal included in the circuit, a semaphoric signal located on that side of the elbow-lever opposite the combustible cord, and a connection extending from the elbow-lever to the semaphoric signal, all substantially as shown.

3. In a railway-signal, the combination, with a bridge, track, or like structure, of a combustible cord located in proximity thereto, an elbow-lever connected with the combustible cord, a semaphoric signal, a connection between the semaphoric signal and the elbow-lever, an electric circuit, contacts in the path of the elbow-lever, and an alarm or signal included in the circuit, all substantially as shown, whereby when the cord is severed the elbow-lever will rock and complete the circuit and also cause or permit the semaphoric signal to be displayed.

4. In combination with a track, bridge, or like structure, a severable cord or connection, C, located in proximity thereto, a post or standard provided with a signal-arm, H, controlled by the cord or connection C, a locomotive provided with stopping mechanism, and an arm carried by the locomotive and adapted to actuate the stopping mechanism when struck by the signal-arm, all substantially as shown, whereby the said signal-arm H is adapted to serve the twofold purpose of a visual signal and as a means for stopping the train in case the said signal should not be observed in time by the engineer.

5. The herein-described railway-signal, consisting in the combination, with a track, bridge, or like structure, of a severable cord or connection, C, located in proximity thereto, an

elbow-lever, D, provided with a weighted arm and connected with the cord C, a semaphoric signal provided with an arm, H, a connection, G, between the elbow-lever and the semaphoric signal, an electric circuit provided with an audible alarm, N, and contact-fingers I and J, arranged in the path of the elbow-lever, substantially as shown, to be brought into contact by the elbow-lever when the cord C is severed.

6. In combination with a bridge, a cord or connection, as C, mounted thereupon, an elbow-lever at each end of the cord or connection, pivoted to the piers or abutments of the bridge, an electric circuit containing an alarm, and contact-fingers, the contact-fingers being arranged in the path of the elbow-lever and thereby adapted to be brought into contact with each other by the elbow-lever when the cord or connection C is severed.

7. In combination with a track, bridge, or like structure, a fusible cord or connection located in proximity thereto and connected with a signaling device, and a board, as T, grooved on its lower edge to receive the cord or connections C, substantially as shown and described.

8. In combination with a railway-track, bridge, or like structure, a visual signal, a normally-open electric circuit, an audible alarm included in the circuit, a circuit-closer, a connection between the circuit closer and the semaphoric signal, and a combustible cord or connection located in proximity to the track, connected with the circuit-closer, and adapted to prevent the completion of the circuit and the display of the semaphoric signal until the said cord is burned or severed.

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

ADELARD FRANCIS MARTEL.

Witnesses:

WALTER S. DODGE,
ANDREW PARKER.