(No Model.) 2 Sheets—Sheet 1.

J. W. STEELE.

DANGER SIGNAL FOR RAILWAY BRIDGES.

No. 401,764. Patented Apr. 23, 1889.

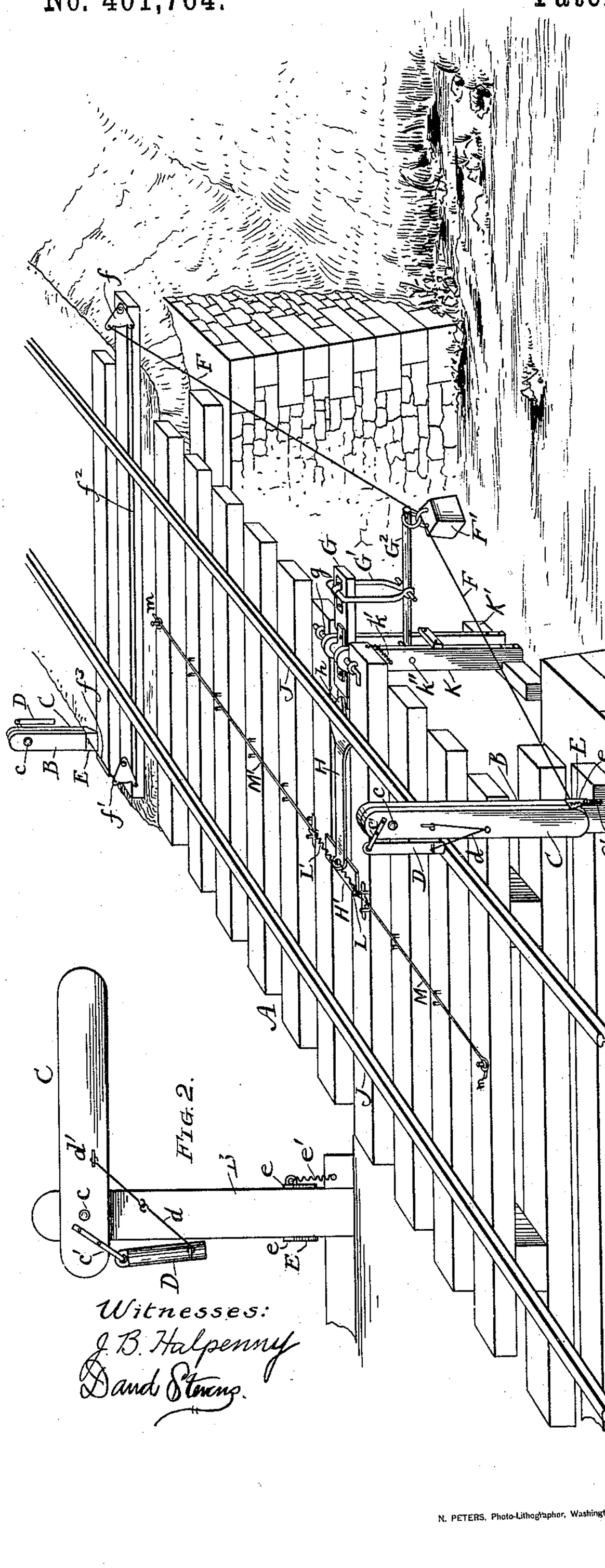

FIG. 1.

FIG. 2.

FIG. 4.

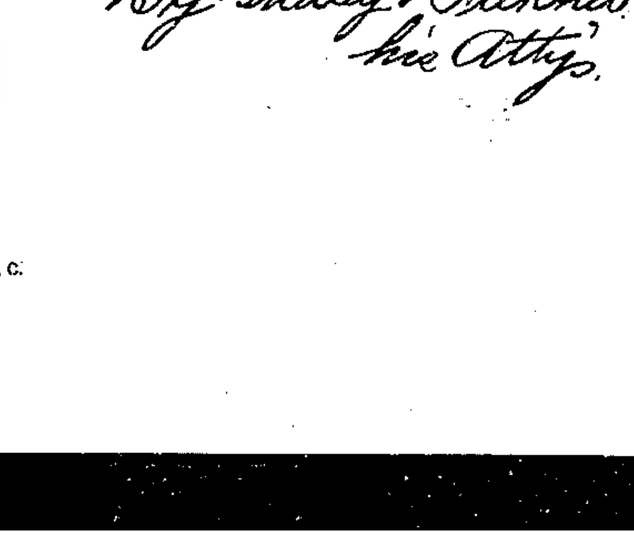

FIG. 3.

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David Stevens.

Inventor:
James W. Steele.
By Gridley & Fletcher.
his Attys.

(No Model.) 2 Sheets—Sheet 2.

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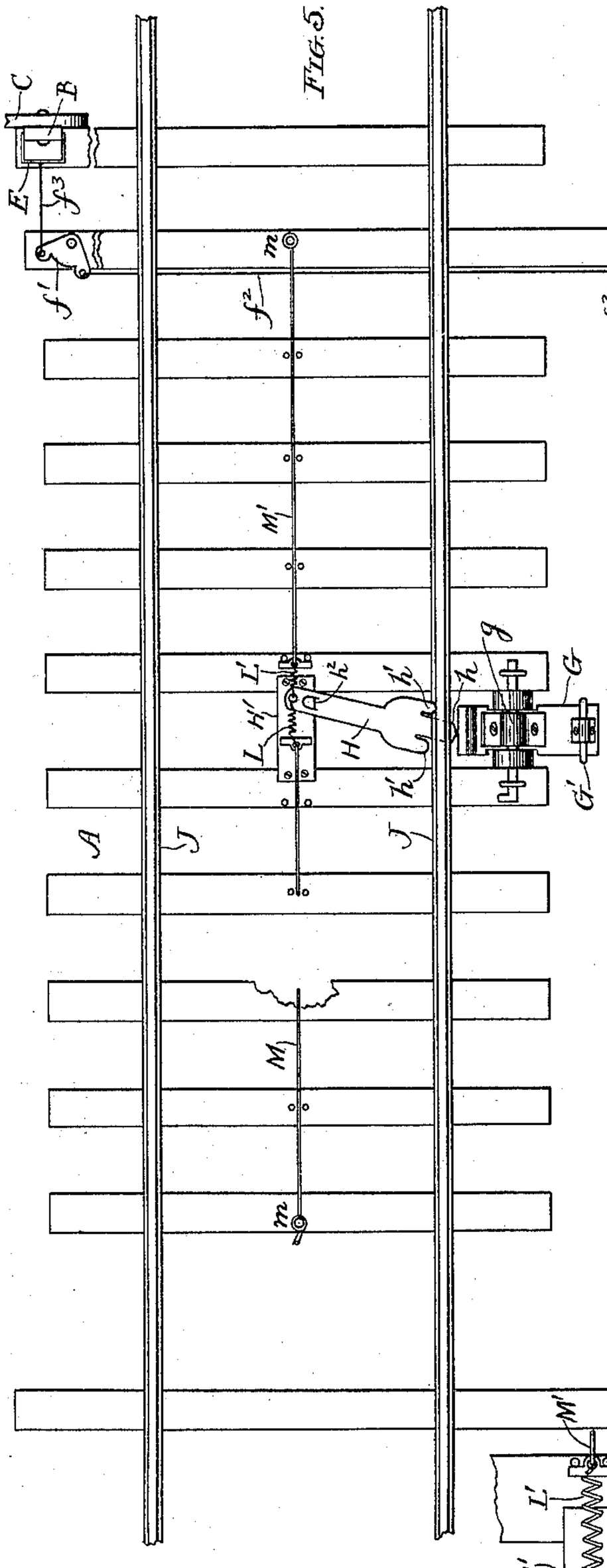

FIG. 5.

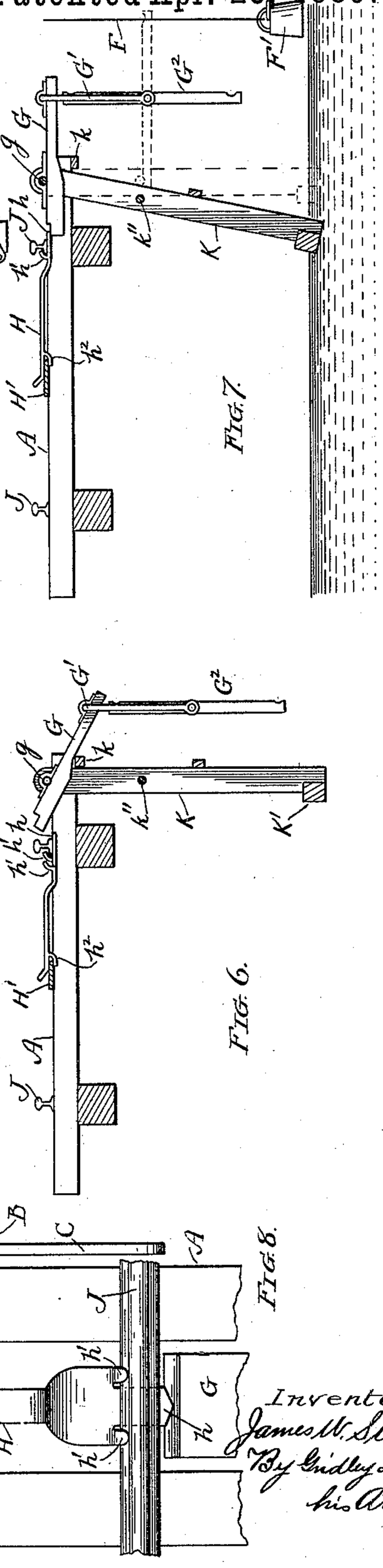

FIG. 7.

FIG. 6.

FIG. 8.

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UNITED STATES PATENT OFFICE.

JAMES W. STEELE, OF TOPEKA, KANSAS, ASSIGNOR OF ONE-HALF TO ANDREW McNALLY, OF CHICAGO, ILLINOIS.

DANGER-SIGNAL FOR RAILWAY-BRIDGES.

SPECIFICATION forming part of Letters Patent No. 401,764, dated April 23, 1889.

Application filed June 1, 1888. Serial No. 275,746. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. STEELE, of Topeka, in the county of Shawnee and State of Kansas, have invented certain new and useful Improvements in Danger-Signals for Railway-Bridges, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in which like letters of reference in the different figures designate corresponding parts.

My invention has for its object to devise means for warning railway-trains of danger resulting from a partial or total destruction of bridges by fire or flood or such an abnormal rise of water as may imperil said bridges. I shall therefore describe hereinafter the means employed and claimed by me for this purpose, as illustrated in said drawings, in which—

Figure 1 is a perspective view of a railway-bridge having my improvements applied thereto, the various parts of which are in a normal position. Fig. 2 is a face view, in detail, of a semaphore in an abnormal position or as displayed to form a danger-signal. Fig. 3 is a side view of the same. Fig. 4 is a plan view thereof. Fig. 5 is a plan view of said bridge, showing the various parts of the warning device in an abnormal position, as caused by a fire. Fig. 6 is a transverse sectional view of the same, showing the tripping mechanism. Fig. 7 is a like view showing the abnormal position of the tripping mechanism when actuated by a rise of water; and Fig. 8 is an enlarged plan view, in detail, of that part of the tripping mechanism which is designed to be actuated by fire.

I will now proceed to describe the details and operation of said improved device.

A indicates the ties and frame-work of an ordinary railway-bridge, at or near each end of which is placed any suitable form of automatic signal, but preferably a semaphore, which consists of a vertical post, B, rigidly attached to one of the ties, having an arm, C, pivoted at *c* near the top thereof, to the short end of which is attached a clevis, *c'*, from which is suspended a weight, D. The lower end of said weight is attached by means of links *d* to said arm at a point, *d'*, upon the opposite side of the pivot *c* from the point of suspension of said weight, so that the long end of the arm may serve as a counterpoise to said weight, and when released may assume and maintain a horizontal position, as shown in Fig. 2.

Pivoted to the post B is a clamp, E, having flanges *e e* sufficiently long to extend beyond and engage with the arm C when in a vertical position, as shown in Fig. 1. A spiral spring, *e'*, serves to normally maintain such engagement. Connecting directly with one of the clamps E, and extending across the stream and connecting with the other of said clamps through intervening elbow-levers *f f'*, attached to the ties and rods f^2 f^3, is a wire, F, which is intended to withdraw the clamps E E and release the arms C, as hereinafter stated. Pivoted at *g*, at or near the middle of the bridge, to the ends of the ties, is a bar, G, the outer end of which is intended to project outwardly beyond the ends of the ties, as clearly shown in Figs. 1 and 7, while the opposite end is intended to rest normally beneath the end of a tripping-plate, H, which projects beneath the track-rail J, the function and operation of which will presently be described. Suspended at the point *g*, and straddling the bar G, is a frame, K, having a cross-bar, K', at the bottom. Said frame is prevented from swinging outwardly by means of a cleat or bar, *k*, Figs. 6 and 7, against which it is normally held by means of a spring, *k'*, Fig. 1. This is for the purpose of preventing it from being thrown out of position by the wind, while a strong current, consequent upon a rise of water, would overcome the resistance of the spring and cause the frame to swing, as shown in Fig. 7.

Loosely attached to the end of the bar G is a stirrup, G', to the lower end of which is pivoted a bar, G^2, the inner end of which is designed to bear beneath a cross-bar, k^2, in the frame K, while to the outer end is detachably suspended, by means of a ring or otherwise, a weight, F', through a staple in which is passed the cord F, as shown in Fig. 1, so that said weight may be transferred to said cord when not supported by the bar G^2. The swinging of the frame K by the current, as shown in Fig. 7, disengages said bar and

permits the weight to fall wholly upon the wire F, which in turn withdraws the clamps E E and permits the arms of the semaphore to be displayed.

In order to guard against danger from fire as well as water, I have provided the tripping-plate H, in connection with springs which tend to disengage it from its connection with the bar G, but are normally prevented from so doing by means of rods, cords, or strips of fusible or inflammable material, so that in case of a fire one or the other of said connections may be destroyed, which permits one of the springs to act when the bar G is tilted and the weight F′ released. The part H is made from a plate of metal, one end, *h*, of which projects beneath the track-rail, while the other extends to a point midway between said rails. Said plate H is provided with bent flanges *h′ h′*, intended to overlap the inner bottom flange of the rail, while the opposite end rests upon a plate, H′, spiked to the ties, a tongue, h^2, serving to hold them in engagement with each other and at the same time permit a lateral movement of the plate H. Attached to the end of the plate H, above the plate H′, are spiral springs L L′, to the opposite ends of which are attached rods, cords, or strips M M′, of fusible or inflammable material—such as zinc, cotton, hemp, or the like—which are extended lengthwise of the bridge, as shown, and attached to the ties at the respective ends, as at *m m*. As bridges usually take fire from sparks from the engine, which find lodgment in weather-cracks in the timbers, the fire in its incipiency is usually confined to the ties or some portion of the bridge between the rails, where the live coals are the most likely to fall. The strips M M′, being placed midway between the tracks, as shown, are almost certain to be affected by the fire in its early stages, and as soon as one or the other is severed thereby the spring connected with the opposite one draws the end of the plate toward it, which serves to withdraw the part *h*, projecting beneath the rail, and the bar G, losing its end support, is tilted, and the weight F′ precipitated upon the wire F, which actuates the signals as effectually as if the frame K had been swung by the action of the water.

The strips M M′ are preferably composed of zinc, as being a substance adapted to be readily consumed by fire and not easily decomposed or otherwise affected by the elements, though rods or cords of any fibrous material—such as hemp or cotton—covered with paraffine or other protective coating may be used, as also may short non-inflammable metal strips jointed together with fusible solder.

The device described is one which may be easily and cheaply constructed and kept in order, and is effectual for the purpose of indicating danger from fire or flood.

Having thus described my invention, I claim—

1. The combination, with a railway-bridge, of automatic signals at or near the ends thereof, a wire or cable for connecting the releasing mechanism of said signals, a float-trigger, a weight attached to said cable at or near the middle of the bridge, a pivoted bar in operative connection with said trigger for normally sustaining said weight, a secondary pivoted bar for sustaining said weight-supporting bar, a tripping-plate for normally holding said secondary bar, springs attached to said tripping-plate, and rods, cords, or strips of fusible or inflammable material attached to the ends of the bridge for holding said springs under resilient tension, whereby a fire or dangerous rise of water may release said weight and actuate said signals, substantially as shown and described.

2. The combination, with a bridge, of the tripping-plate H, springs L L′, rods, cords, or strips M M′, for holding said springs under resilient tension, bars G G^2, the latter being suspended from the former, float-trigger K, weight F′, and cable F, in operative connection with automatic signals at or near the ends of the bridge, substantially as shown and described.

In testimony whereof I have signed this specification, in the presence of two subscribing witnesses, this 15th day of May, 1888.

JAMES W. STEELE.

Witnesses:
D. H. FLETCHER,
J. B. HALPENNY.