(No Model.) 2 Sheets—Sheet 1.

J. W. STEELE.

DANGER SIGNAL FOR RAILWAY BRIDGES.

No. 401,763. Patented Apr. 23, 1889.

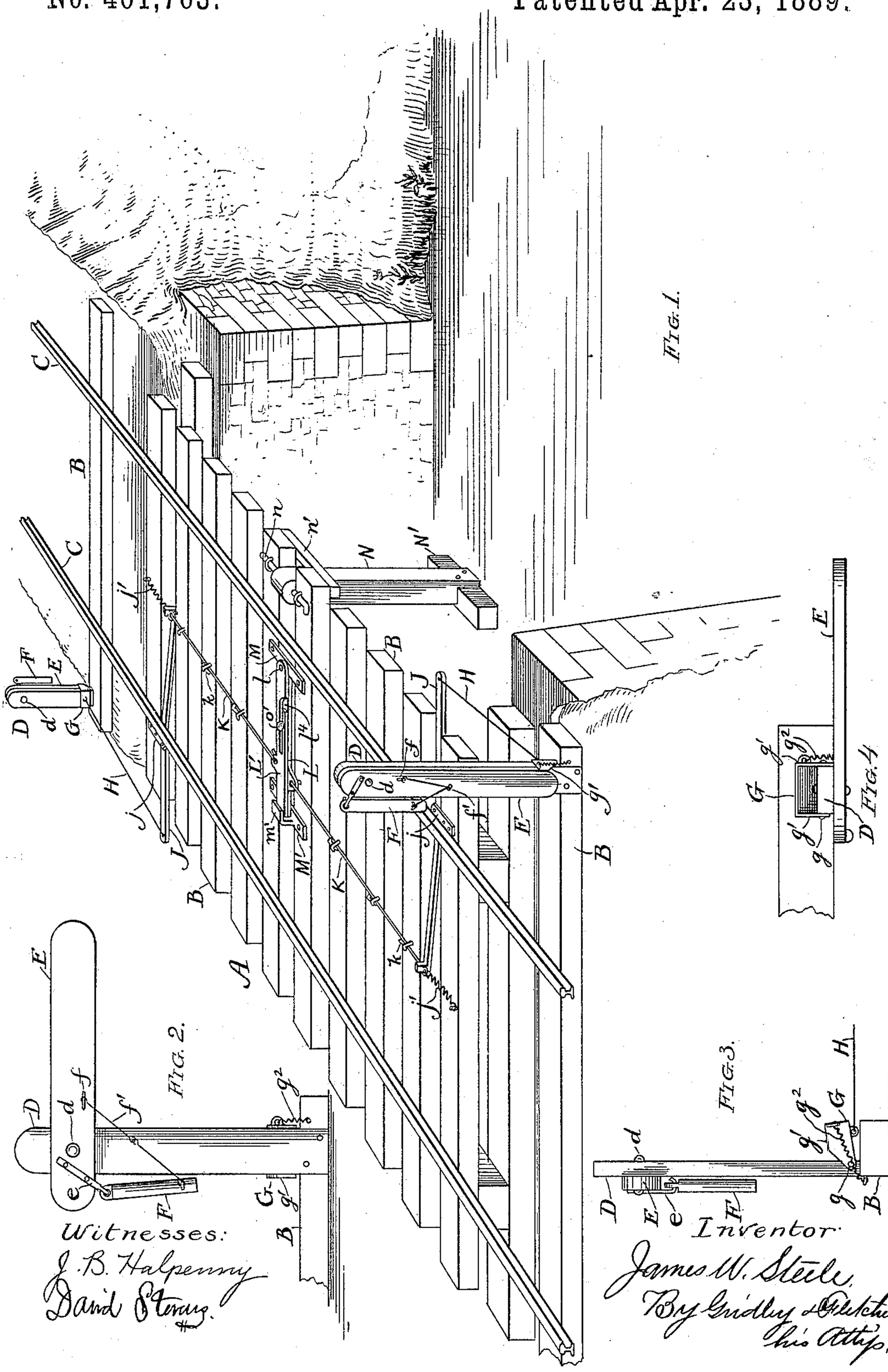

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

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J. B. Halpenny
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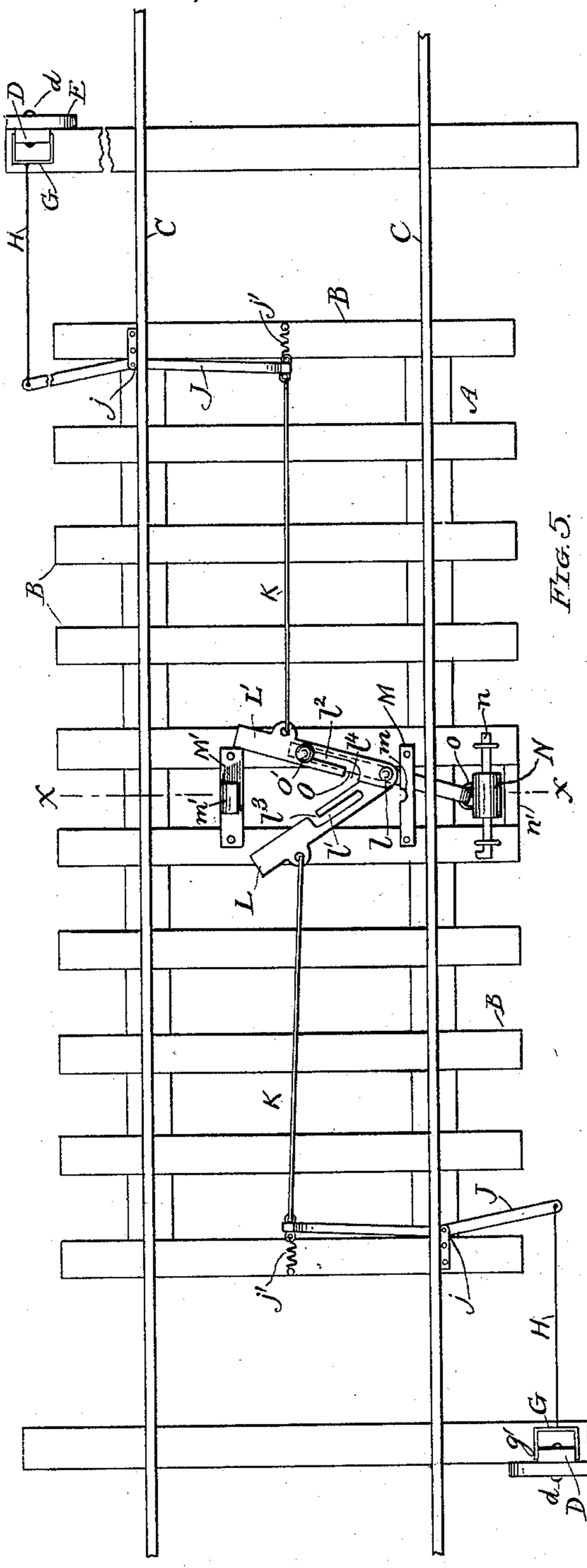

FIG. 5.

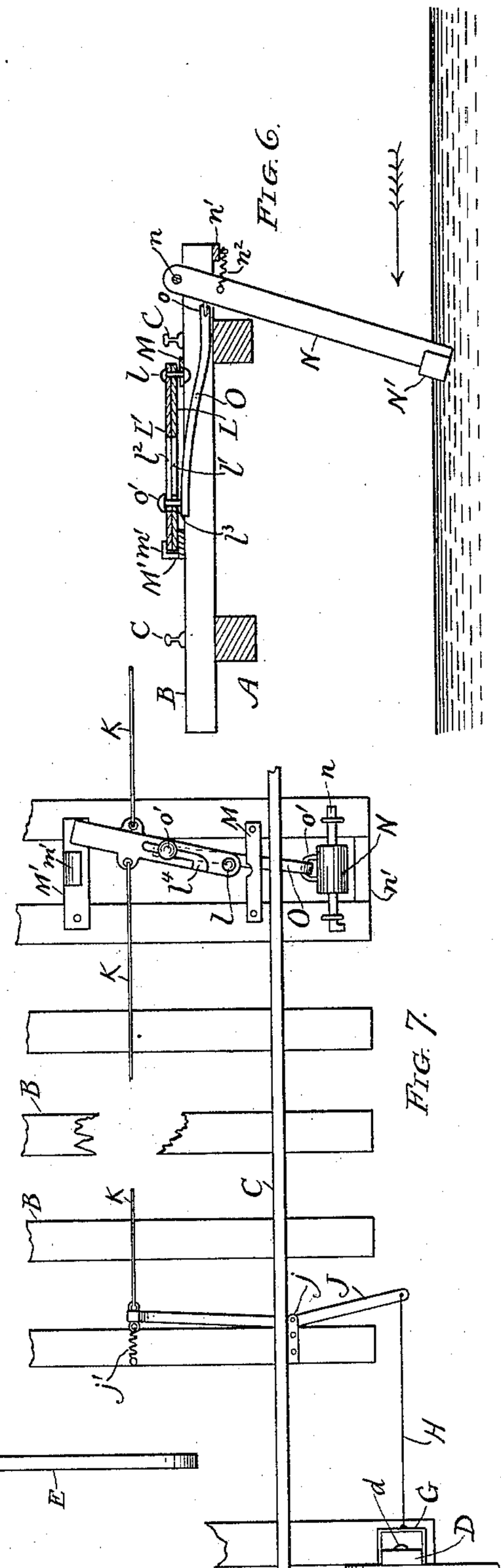

FIG. 6.

FIG. 7.

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UNITED STATES PATENT OFFICE.

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DANGER-SIGNAL FOR RAILWAY-BRIDGES.

SPECIFICATION forming part of Letters Patent No. 401,763, dated April 23, 1889.

Application filed June 1, 1888. Serial No. 275,745. (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—

Figure 1 is a perspective view of a railway-bridge, showing my improved signaling device applied thereto, the parts of which are shown in their respective normal positions. Fig. 2 is a face view in detail of a semaphore or signal as the same is displayed when in an abnormal position. Fig. 3 is a side view of the same when in like position. Fig. 4 is a plan view thereof. Fig. 5 is a plan view of the bridge, showing the parts as they appear when released by the tripping mechanism. Fig. 6 is a transverse sectional view of the same, taken upon the line x x, Fig. 5; and Fig. 7 is a plan view in detail of a portion of said bridge, showing the parts as they appear when released by the action of the fire.

Corresponding letters of reference designate like parts in the various figures.

Heretofore no means has been provided for warning approaching trains of danger resulting from the total or partial destruction of bridges by fire or water.

The purpose of my invention is to provide a device whereby the destruction of a bridge in whole or in part, either by fire or water, or the rise of water to a dangeous extent, may be promptly indicated by means of semaphores or other analogous signals. I accomplish said purpose by providing automatic signals at or near the respective ends of the bridge with rods, cords, or strips of fusible or inflammable material for retaining said signals in a normal position, and a trigger-releasing mechanism adapted to be actuated by an abnormal rise of water, all of which is hereinafter more particularly described, and definitely pointed out in the claims.

A in the drawings represents a railway-bridge, of which B indicates the ties, and C the rails. At or near the respective ends of the bridge I place automatic signals or semaphores, which are preferably constructed as follows:

D D represent vertical posts, which are bolted or otherwise rigidly attached to the ties B. Pivoted at d is an arm, E, to the short end of which is loosely attached by means of a clevis, e, Figs. 1 and 2, a weight, F, the lower end of which is attached to the arm E at a point, f, opposite the pivotal point d by means of a chain or link, f', whereby the long end of the arm, when extended, as in Fig. 2, serves as a counterpoise to said weight, and the arm is maintained in a horizontal position. Said arm is retained normally in a vertical position, as shown in Fig. 1, preferably by means of a clamp, G, which is pivoted at g to the post D.

Flanges g' g' are made to overlap the post D, and thus clasp the lower end of the arm E, in which position said clamp is normally held by means of a spiral spring, g^2. A rod, H, is loosely attached to each of said clamps G, and in turn to the end of a bent lever, J, which is pivoted at j to the ties or frame-work at the respective ends of the bridge. To the opposite end of each of said levers is attached a spiral spring, j', which is also secured to the bridge, as shown, and which tends to operate the arm J, so as to disconnect the clamp G from its engagement with the arm E. The ends of the levers J J to which said springs are attached are connected by means of wires, rods, strips, or cords K K to jaws L L′ of a releasing mechanism intended to be operated by means of a floating trigger actuated in turn by an abnormal rise of water. The jaws L L′ are hinged to each other by a rivet, l, which is long enough to project beneath, as shown in Fig. 6, and to engage within a notch, m, formed in a plate, M, which is rigidly spiked to the ties. A secondary plate, M′, is also attached to said ties at the opposite end of said jaws, and is provided with a flange, m', Figs. 1, 5, and 6, which is arranged to overhang and engage with said jaws when in their normal position, as shown in Fig. 1, while it leaves them free to open.

The jaws L L′ are provided with slots l' l^2, respectively, each of which is cut in from the inner side of the jaw, one at the end of the

slot nearest to the free end of the jaw, while the other is at the opposite end, as shown at l^3 l^4, Figs. 5 and 6.

N is a bar made from a piece of ordinary bridge-timber, suspended from a pin or cross-bar, n, attached by means of staples, or in any well-known way, to the outer end of the ties. Said bar N is provided with a cross-bar, N′, attached to the bottom thereof, and its outward movement is limited by means of the cross-bar n'. A spiral spring, n^2, Fig. 6, serves to normally retain said bar against the bar n' and to prevent its being swung by the wind; but it is not strong enough to withstand the action of a current of water against it.

Pivoted at o, Fig. 6, to the bar N is an iron rod, O, provided with a rigid stud, o', extending upwardly therefrom, having an enlarged head at the top. The stud is of such a size that it may slide freely in the slots l' l^2, while it is prevented from falling downwardly and out of engagement with the slots by means of the enlarged head. In placing said stud in position the jaws L L′ are permitted to expand, as in Fig. 5, when the stud is inserted in the slot l^2. It is then pushed forward to the end of the slot, when it is opposite the notch l^3. The jaws are then drawn together beneath the flange m', when the bar N assumes a vertical position and draws the stud o' back in the slots of the jaws, as shown in Fig. 1, thus holding them together while the rods K K and springs j' j' are under tension. The bars N N′ and bar O, with its stud o', I term a "float-trigger."

In the event of an unusual rise of water the cross-bar N′ is carried forward with the current, as shown in Fig. 6, when the stud o' is thereby moved opposite to the notch l^3, when the jaw L is released and opened by the spring j'. Its counterpart L′, having nothing to sustain it, is drawn in an opposite direction, said springs j' j' serving simultaneously to operate the signals.

It is thus obvious that in case the bridge should be washed away, or in the event of a dangerous rise of water, the float-trigger would be actuated and the signals displayed, and this would be true regardless of the material of which the connections K K might be constructed. It is also apparent that in case one of said connections should become broken the releasing mechanism would be actuated just the same. I therefore drive spikes k k upon opposite sides of the rods K, so that their heads or hooks may project over said rods, and in case a portion of the bridge should fall from any cause the rod K would be broken and the signal displayed; but I prefer to make the connections K of rods, cords, or strips of combustible or fusible material, and to this end I recommend a flat strip of zinc; but a rope or cord of hemp, cotton, or any analogous material may be employed. In Fig. 7 I have shown a single tie partially burned away beneath one of these inflammable connections and its effect upon the operating mechanism. It is therefore clearly manifest that warning would be given to approaching trains in the event of a washout, a dangerous rise of water, the falling of a part or all of the bridge, or its partial or total destruction by fire. The cost of said device is but nominal, its construction simple, and it is easily kept in order by a workman of ordinary skill.

Having thus described my invention, I claim—

1. The combination, with a bridge, of hinged and slotted jaws normally held together by a pin or stud in operative connection with a float-trigger, rods, cords, or strips K K, attached to said jaws, respectively, and to the ends of the bridge, springs for holding said cords under resilient tension, and signals at or near the ends of said bridge in operative connection with said springs, whereby the severing of one or both of said cords will permit the springs to recoil and operate the signals, substantially as shown and described.

2. The combination, with a railway-bridge, of automatic semaphores or signals arranged, respectively, at or near the ends of the bridge, the slotted jaws L L′, wires, rods, or strips for connecting the same with said automatic signals, and a float-trigger having a rod, O, and stud o', substantially as shown and described.

3. The combination, with a railway-bridge, of automatic semaphores or signals arranged, respectively, at or near the ends of the bridge, slotted jaws L L′, a float-trigger for releasing said jaws, and rods or strips of a fusible or inflammable material for connecting said jaws with said automatic signals, substantially as shown and described.

4. In a danger-signal for railway-bridges, the hinged jaws L L′ in operative connection with automatic signals at or near the ends of the bridge, a pin, o', for normally holding said jaws together, a suspended float-trigger in operative connection with said pin, and means—such as the cleat n' and spring n^2—for preventing the swinging of said frame by the action of the wind, 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.