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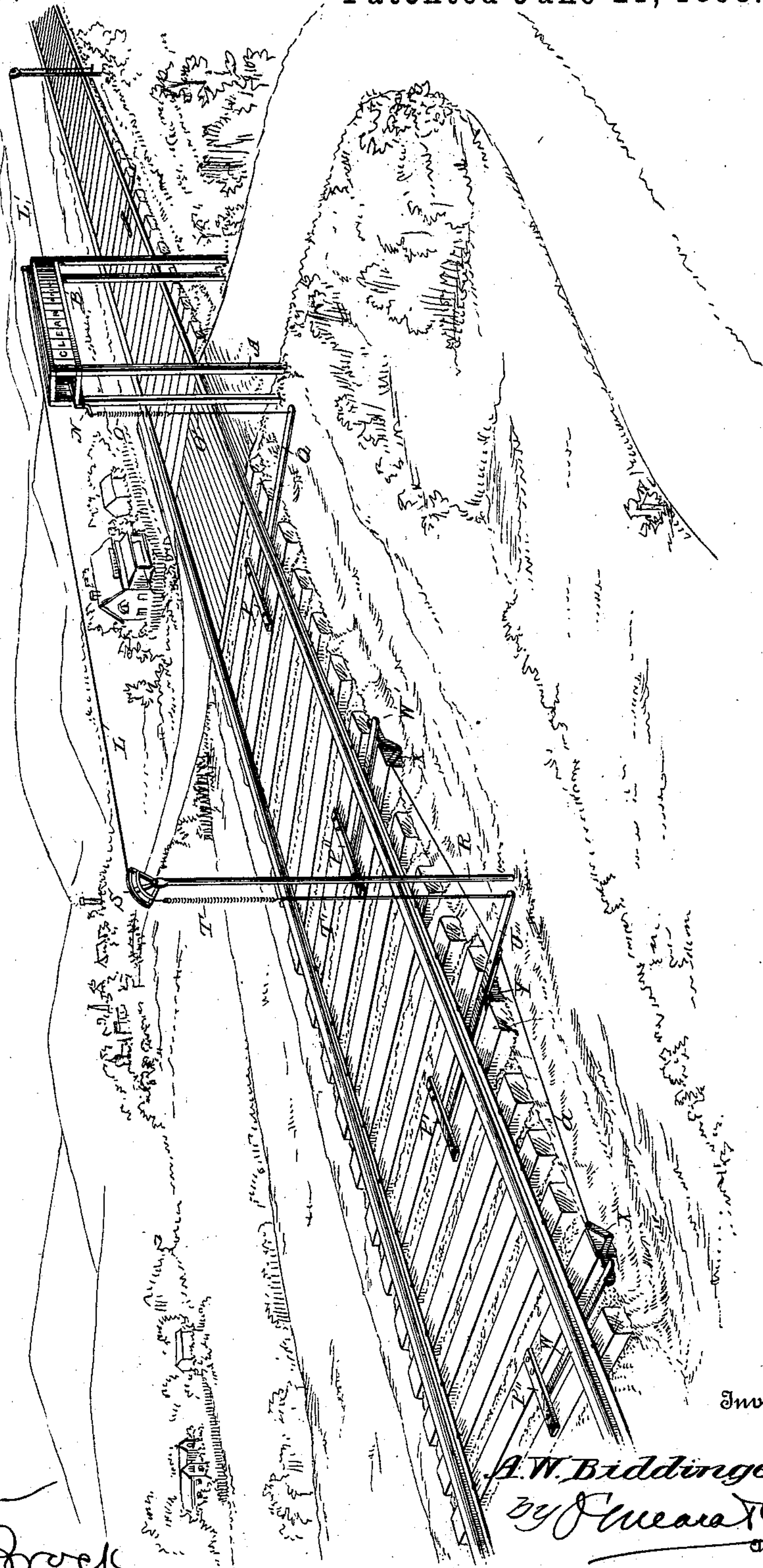
3 Sheets—Sheet 1.

A. W. BIDDINGER.  
RAILWAY SIGNAL.

No. 605,847.

Patented June 21, 1898.

Fig. 1.



Witnesses

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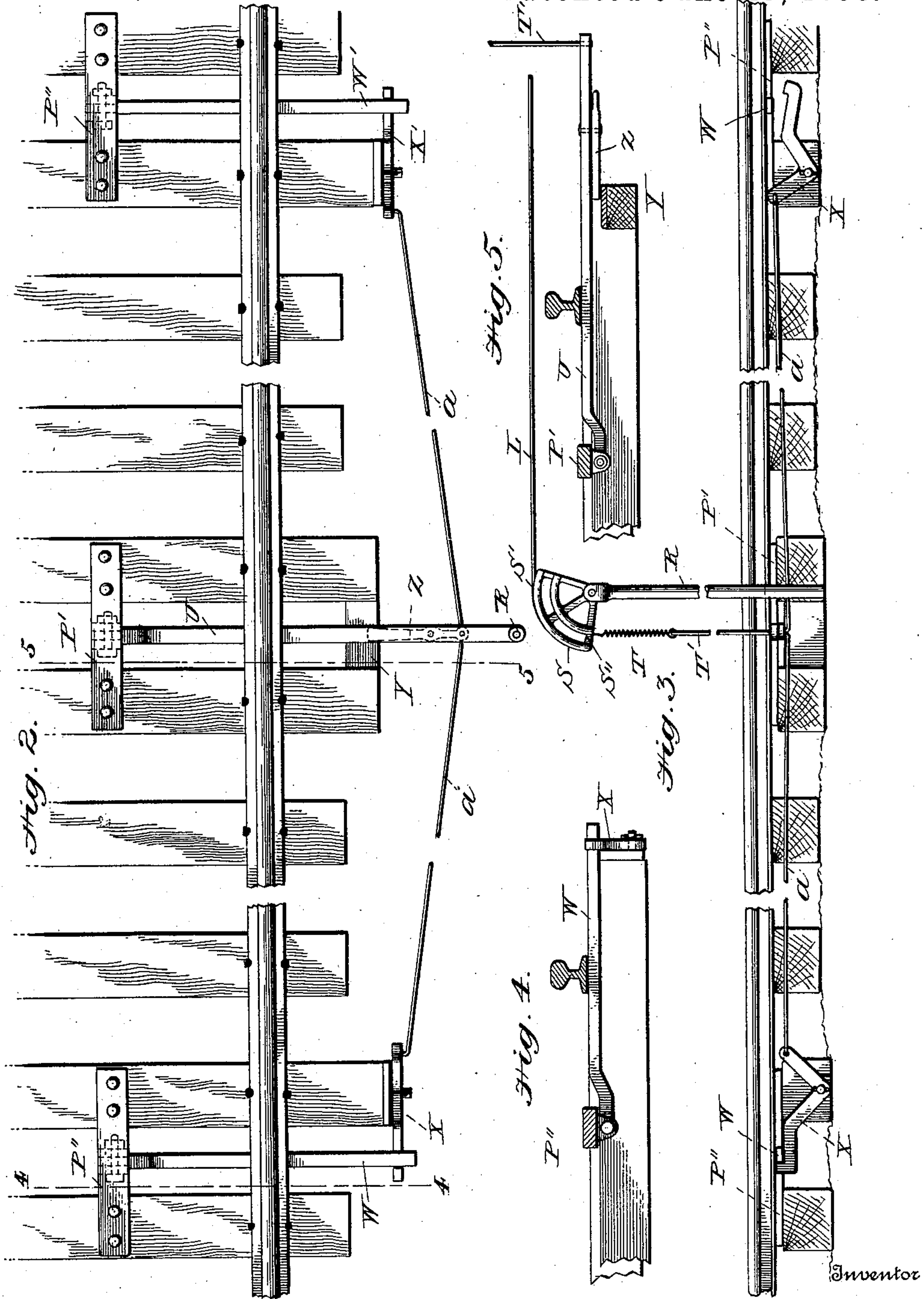
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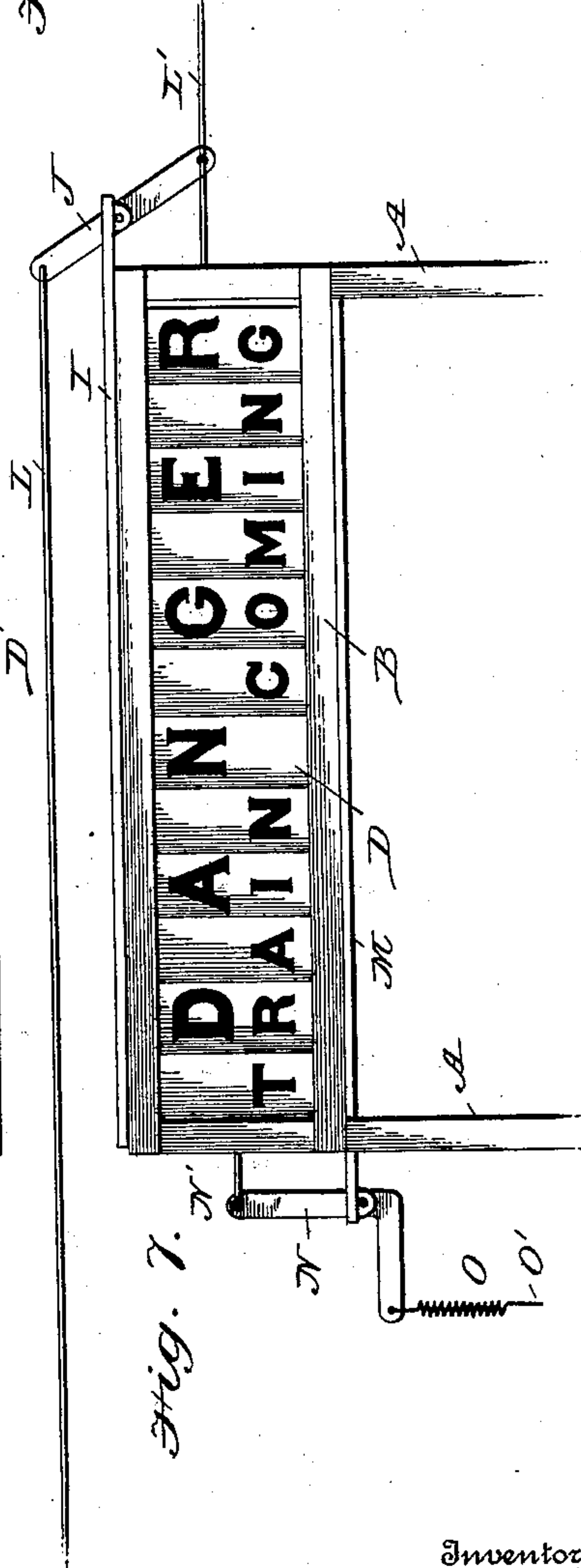
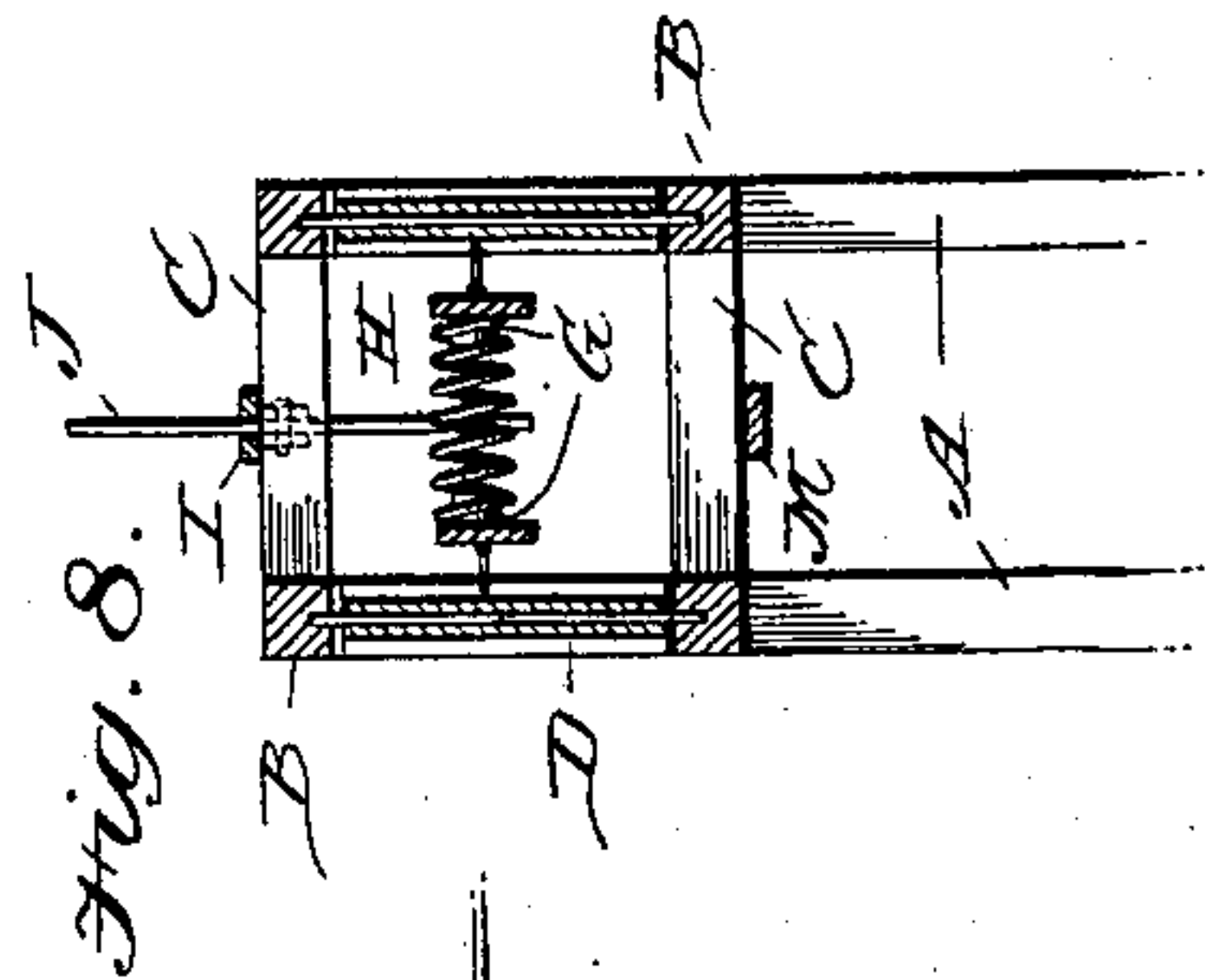
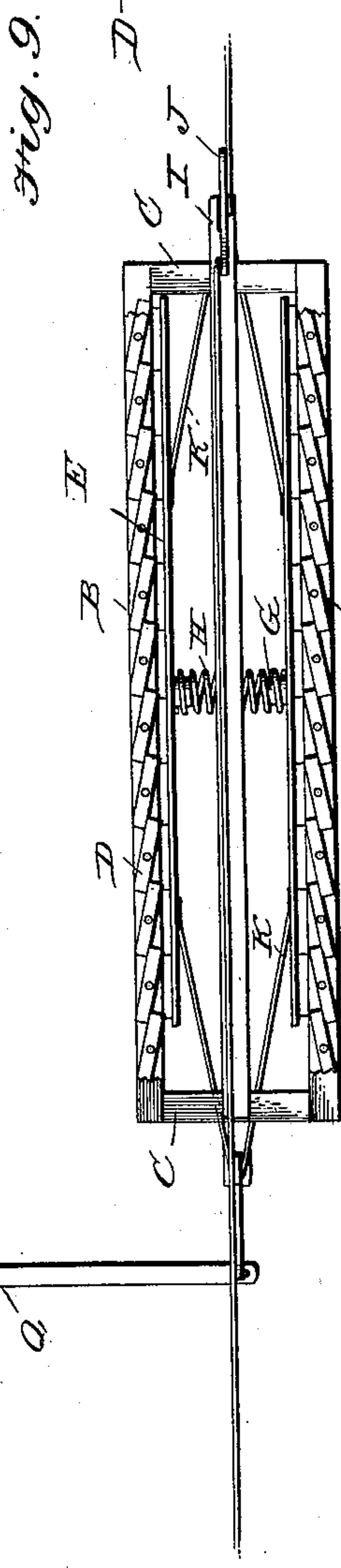
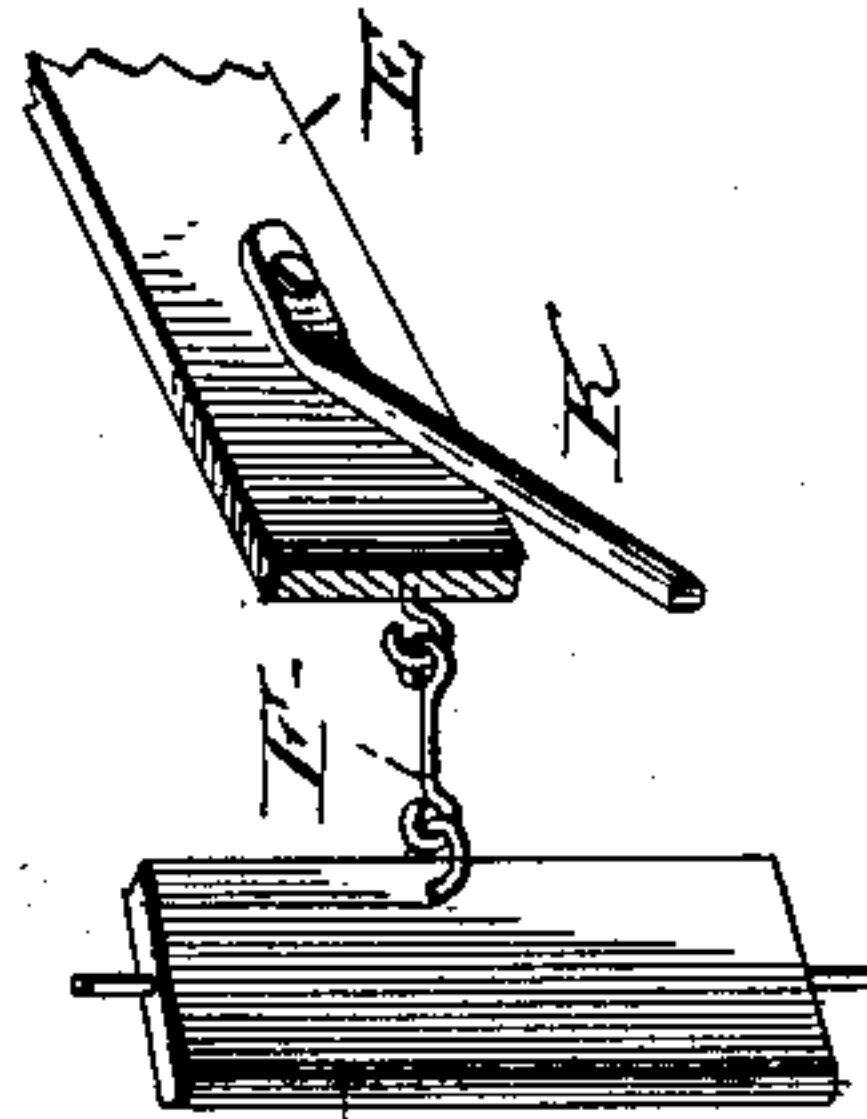
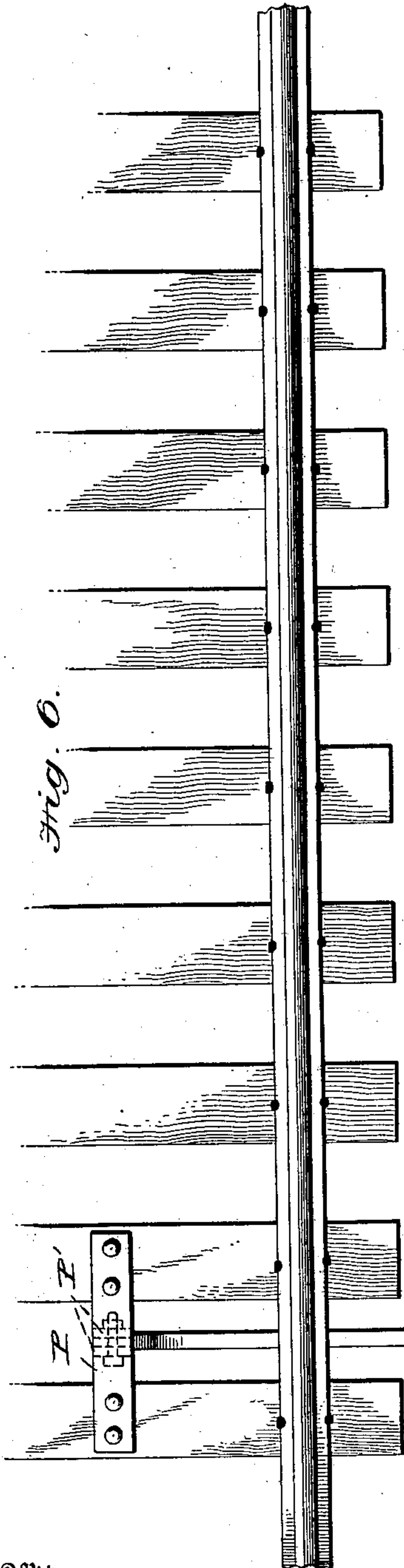
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# UNITED STATES PATENT OFFICE.

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## RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 605,847, dated June 21, 1898.

Application filed November 8, 1897. Serial No. 657,854. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT W. BIDDINGER, residing at Harrison, in the county of Hamilton and State of Ohio, have invented a new and useful Railway-Signal, of which the following is a specification.

This invention relates generally to signals, and particularly to automatic signals for railroad-crossings.

10 The object of the invention is to provide a simple and effective signal-operating mechanism which is actuated by a train approaching in either direction and at any desired distance from the crossing.

15 Another object is to provide a signal which is particularly adapted for single-track roads and which is operated by trains approaching in either direction.

20 A further object is to provide a locking mechanism for the purpose of preventing the tripping of the signal by trains leaving the crossing.

25 A still further object is to provide a mechanism actuated by the train for operating the locking mechanism.

30 With the above objects in view the invention consists of a signal normally indicating a clear track, a tripping-lever positioned on each side of the crossing at any distance therefrom and actuated by the springing of the rails when the train is passing thereover for the purpose of tripping the signal and displaying the danger sign; a tripping-lever positioned on one side of the crossing, actuated similarly to the first-named tripping-lever for changing the signal from "danger" to "clear," a locking device for preventing the operating of the tripping-lever for the danger sign by a train leaving the crossing, and a mechanism 40 actuated by the springing of the rail when the train is passing thereover for operating the locking mechanism.

45 My invention further consists in the improved construction, arrangement, and combination of parts hereinafter fully described, and afterward specifically pointed out in the appended claims.

50 In order to enable others skilled in the art to which my invention most nearly appertains to make and use the same, I will now proceed

to describe its construction and operation, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view showing the practical application of my invention. Fig. 2 is a top plan view of a portion of the track, showing the locking mechanism and the tripping mechanism therefor. Fig. 3 is an elevation of the same. Fig. 4 is a sectional view on line 4 4 of Fig. 2. Fig. 5 is a similar view on line 5 5 of Fig. 2. Fig. 6 is a top plan view of the signal-box and the tripping-lever for displaying the clear-track sign. Fig. 7 is an elevation of the signal-box. Fig. 8 is a vertical transverse sectional view of the same. Fig. 9 is a detail view of the pivoted sections of the signal, showing the manner of connecting the same with the sliding reversing-bar.

In the accompanying drawings, A indicates four uprights placed two on each side of the crossing and supporting the signal-box, which consists of the longitudinally-extending bars B and cross-pieces C, thus forming a frame.

Pivoted at their upper and lower ends between the top and bottom bars of the frame are the sections D, which are adapted to overlap at their edges. Arranged on the opposite faces of these sections are letters adapted to form the words "Danger, train coming" when one face is turned outward and "Clear track" when the opposite face is displayed. A series of these pivoted sections is arranged at each side of the frame, so that the sign is displayed to persons approaching from either side of the crossing. For reversing the sections I provide a longitudinally-movable bar E for each series, each section being loosely connected thereto by a link F. Projecting inwardly from each bar and at the center thereof is a pin G, and coiled at each end about these pins is a spring H, which serves to hold the signal-sections normally face outward, displaying either the danger or clear sign.

Intermediately pivoted to the projecting end of a bar I, secured to the top of the frame, is a lever J, to the lower end of which the rods K are loosely attached, the opposite end of one of said rods being secured to one of the



reversing-bars and the end of the other rod to the opposite reversing-bar, so that as said lever is actuated the danger-sign on both sides of the box is simultaneously displayed through the medium of the reversing-bar. A cable L is secured to the upper end of said lever and a cable L' to the lower end, said cables extending to opposite sides of the crossing.

Pivoted to the end of a longitudinally-extending bar M, secured to the bottom of the frame, and projecting at the opposite end thereof from the bar I is the bell-crank lever N, to the upper end of which the rods N' are loosely attached, one of said rods being secured at its opposite end to one of the reversing-bars and the end of the other rod to the opposite reversing-bar, so that as said lever is actuated the signal-sections at both sides of the box are simultaneously reversed, displaying the clear-track sign. To the opposite end of the bell-crank lever the coiled spring O is attached, said spring being attached at its opposite end to a rod O'.

I will now describe the tripping mechanism for displaying the clear-track sign. A plate P is secured at its opposite ends to two of the ties adjacent the crossing, said ties being placed a short distance below the rail, so that the latter will spring downwardly when the train passes thereover. Lugs P' depend from the under side of this plate at its center, and pivoted therebetween is the tripping-lever Q, which extends beneath the rail and transversely of the track. To the outer end of this lever the lower end of the rod O' is attached. When the danger-signal is displayed, the tripping-lever will be held in engagement with the under side of the rail, so that as the train passes over the rail the same will spring downward slightly, depressing said tripping-lever and, through the medium of the bell-crank lever and reversing-bar, changing the signal to "Clear track." The rail will then return to its normal position, leaving a space between its under side and the tripping-lever.

I will now set forth the construction of the mechanism for displaying the danger sign, the locking mechanism therefor, and the lock-actuating mechanism, which mechanisms are duplicated on each side of the crossing. Positioned at any desired distance from the crossing is a post R, to the top of which the segment S is pivoted, said segment being provided with the grooves S' and S'', the former receiving the cable L, which has its end attached to the segment, and the latter the upper end of the downwardly-extending coiled spring T, which at its lower end is secured to a rod T'.

A plate P', similar to the plate P before described, is secured at its ends to two adjacent ties which are placed slightly below the rail, and to the under side of this plate the tripping-lever U is pivoted, said lever passing beneath the rail and being normally in contact with the under side thereof. To the outer end of this lever is attached the lower

end of rod T', so that as the train passes over the rail the latter springs downwardly, depressing the tripping-lever and setting the danger-signal. Plates P'' are provided at any desired distance on opposite sides of tripping-lever U, said plates being secured at their opposite ends to adjacent ties, which are positioned a slight distance below the track, as before described of the ties to which the tripping-levers Q and U are pivoted. Pivoted to the respective plates P'' are the levers W and W', which extend beneath the rail and transversely thereof, said levers adapted to alternately engage the under surface of the rail. One of the ties to which each plate P'' is secured is extended beyond the ends of the remaining ties, and to this extended end of the tie a bell-crank lever X is pivoted, the said levers extending in reverse directions and having their outer ends extended horizontally beneath the levers W and W', which rest thereon. A cross-piece Y connects the ties beneath the tripping-lever U, leaving a space between the under side of the lever and the upper surface of the cross-piece, and intermediately pivoted to the under side of the lever is a locking bar or key Z, which is adapted at its inner end to swing into said space between the lever and cross-piece, so as to lock the lever against the rail and prevent the former from being depressed when the train passes over the rail. It will thus be understood that when said locking-bar is in position the signal cannot be operated by the tripping-lever U. Cables or rods a are connected at one end to the outer end of the locking-bar and at their opposite ends to the inner ends of the respective bell-crank levers X.

The operation of my invention is as follows: Suppose a train to be approaching in the direction indicated by the arrow in Fig. 1. The tripping-lever W will be depressed when the train passes over the rail, thus depressing the outer end of bell-crank lever X, and raising its inner end, which draws upon the rod a and swings the locking-bar from beneath the tripping-lever U, thus permitting the latter to be depressed when the train reaches that point. The danger-signal will be operated by the depression of the tripping-lever U, as before described. By the movement of the first-named bell-crank lever X and the locking-bar the outer end of the bell-crank lever X on the opposite side has been raised so that the tripping-lever W' is in engagement with the underside of the rail. Now as the train passes this point said lever W' is depressed, which, through the medium of the bell-crank lever X, returns the locking-bar to its position beneath the signal-tripping lever U, lowering lever W' from contact with the rail and raising lever W in contact therewith. When the train reaches the lever I, the signal is changed to "Clear Track," as before set forth. Now suppose a train to be approaching in the opposite direction. The mechanism on the op-



posite side of crossing operating as described above sets the danger-signal. When the train passes the crossing, the signal is changed to "Clear Track" by the tripping-lever Q.

5 As the train passes over the lever W' the same is not depressed, as it is out of engagement with the rail, and consequently the locking-bar is not operated. Thus the locking-bar being beneath the tripping-lever U the  
10 signal is not changed, so that in leaving the crossing the train does not set the danger-signal. When the train passes over the operating-lever W, the same being in engagement with the rail it is depressed and the  
15 locking-bar swung from beneath the tripping-lever U. Thus the lever W will be out of contact therewith when the next train approaches, which operates the signal-lever U and locks the same through the medium of  
20 lever W'.

From the above description it will be seen that I have produced a signal-operating mechanism which is simple in construction and effective in operation, in which it is impossible  
25 for a train to approach the crossing from either direction without displaying the signal and to operate the danger-signal in leaving the crossing.

While I have illustrated and described what  
30 I consider to be the best means for carrying out my invention, I do not wish to be understood as limiting myself to the exact details shown and described, but hold that any slight changes, such as might suggest themselves to  
35 the ordinary mechanic, would properly fall within the limit and scope of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

40 1. The combination with a signal, of a tripping-lever therefor which is adapted to be actuated by the train, a lock for said lever, and operating-levers positioned on opposite  
45 sides of said tripping-lever, and actuated by the train, one of said operating-levers adapted

to lock the tripping-lever and the other to unlock the same, substantially as described.

2. The combination with a signal, of a tripping-lever therefor, actuated by the train, a lock for said lever, an operating-lever positioned on each side of said tripping-lever and  
50 operated by the depression of the rail, bell-crank levers pivoted adjacent said operating-levers with their outer ends supporting the same, said operating-levers alternately engaging the rail, and an operative connection  
55 between the inner ends of the bell-crank levers and the lock, substantially as described.

3. The combination with the rail, of a tripping-lever adapted to engage said rail and be depressed thereby, a lock for preventing the  
60 depression of the lever, means operated by the train for operating said lock to engage and release the tripping-lever, and a signal operated by the tripping-lever, substantially  
65 as described.

4. The combination of the rail, the ties positioned a slight distance therebeneath to permit the rail to swing downwardly, a tripping-lever pivotally mounted and extending beneath the rail and transversely thereof, a block  
70 positioned a slight distance beneath said lever, a locking-bar pivoted to said lever and adapted to swing therebeneath between the under side thereof and the block and prevent  
75 the depression of said lever, operating means actuated by the train and positioned on opposite sides of the tripping-lever for the purpose of swinging said locking-bar, and a signal  
80 operated by the tripping-lever, substantially as described.

5. The combination of a support, a series of sections pivoted therein, a reversing-bar to which the sections are connected, a spring for holding the sections with their faces outward, substantially as described.

ALBERT W. BIDDINGER.

Witnesses:

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