

(No Model.)

3 Sheets—Sheet 1.

G. D. FOWLE.

INTERLOCKING SWITCH AND SIGNAL.

No. 389,558.

Patented Sept. 18, 1888.

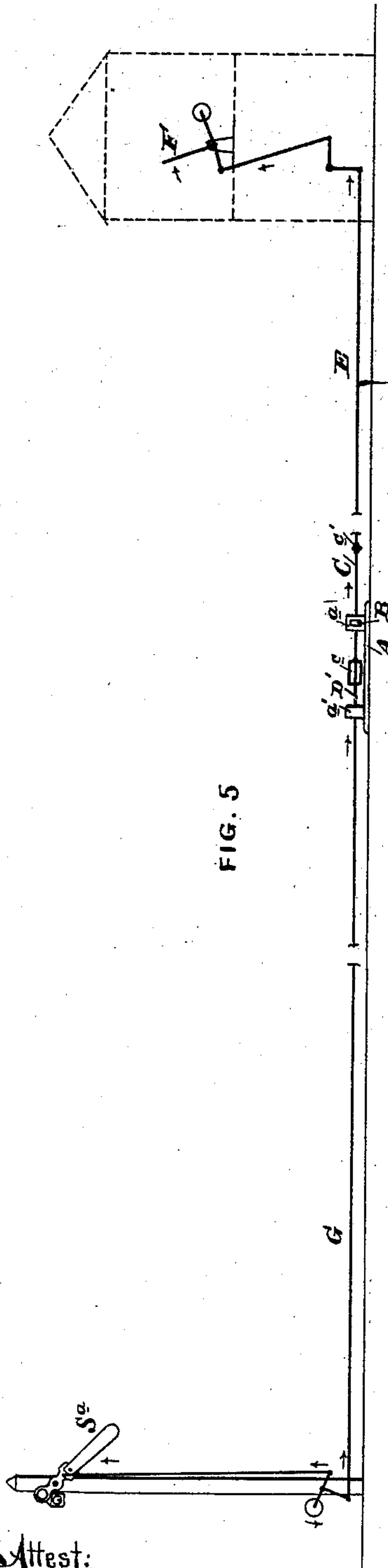


FIG. 5

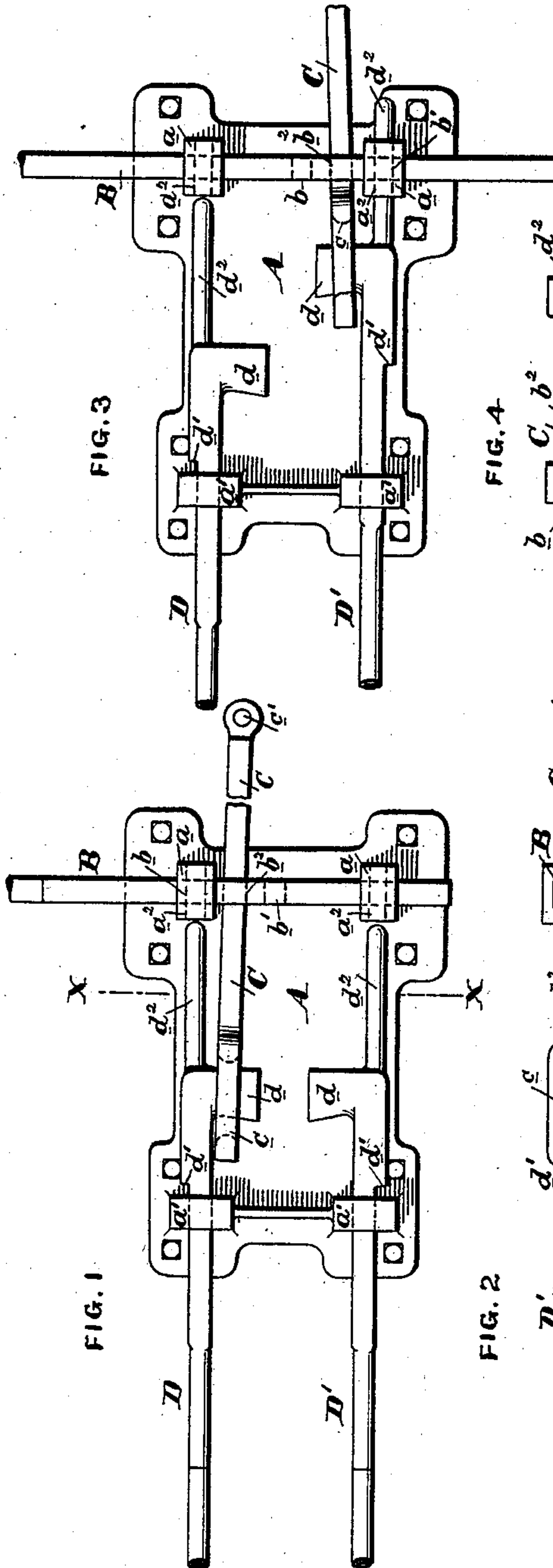


FIG. 1

FIG. 3

FIG. 4

FIG. 2

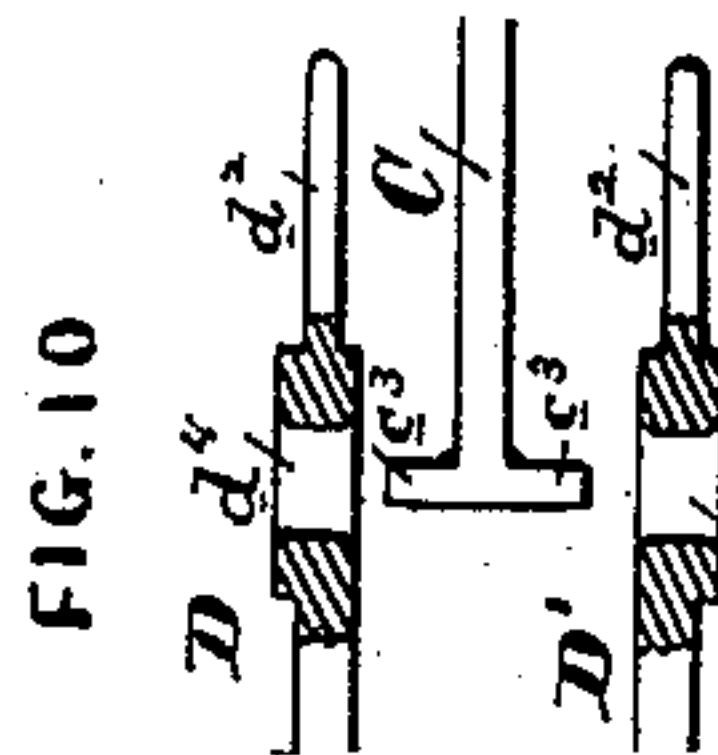


FIG. 10

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by his attorney
Francis T. Chambers

Attest:
Henry D. Fowle
Joshua M. Hallack, Jr.

(No Model.)

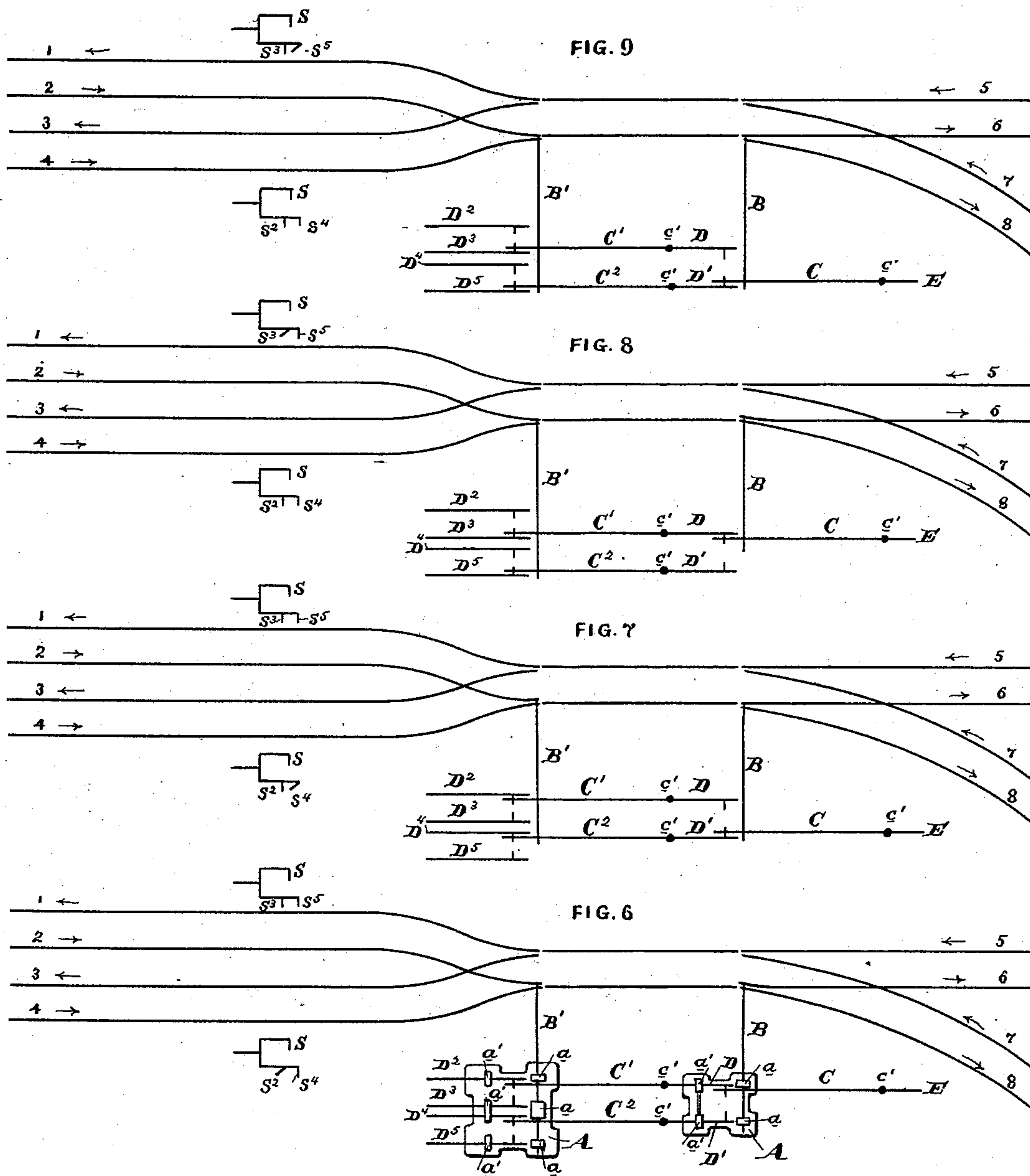
3 Sheets—Sheet 2.

G. D. FOWLE.

INTERLOCKING SWITCH AND SIGNAL.

No. 389,558.

Patented Sept. 18, 1888.



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(No Model.)

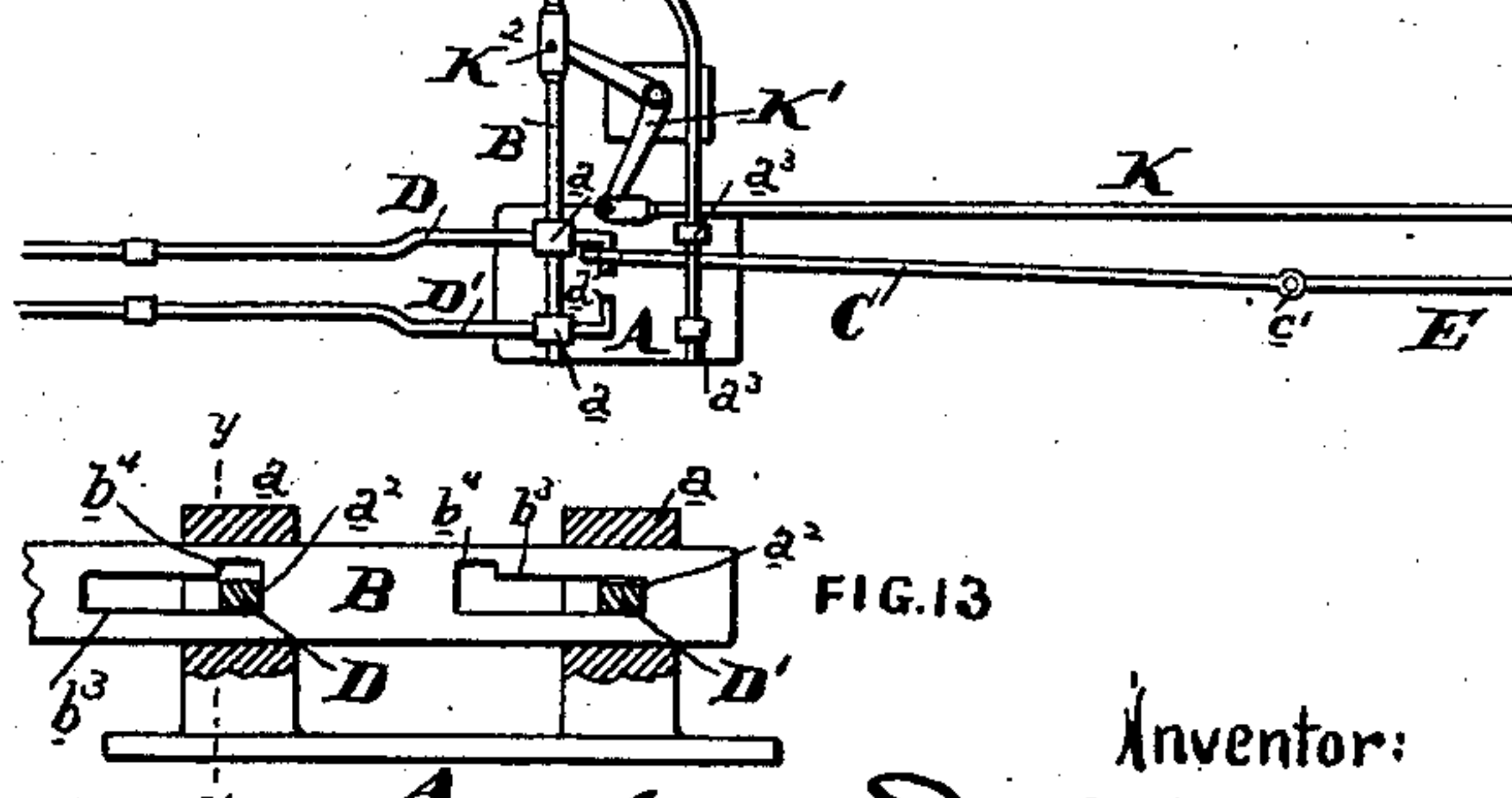
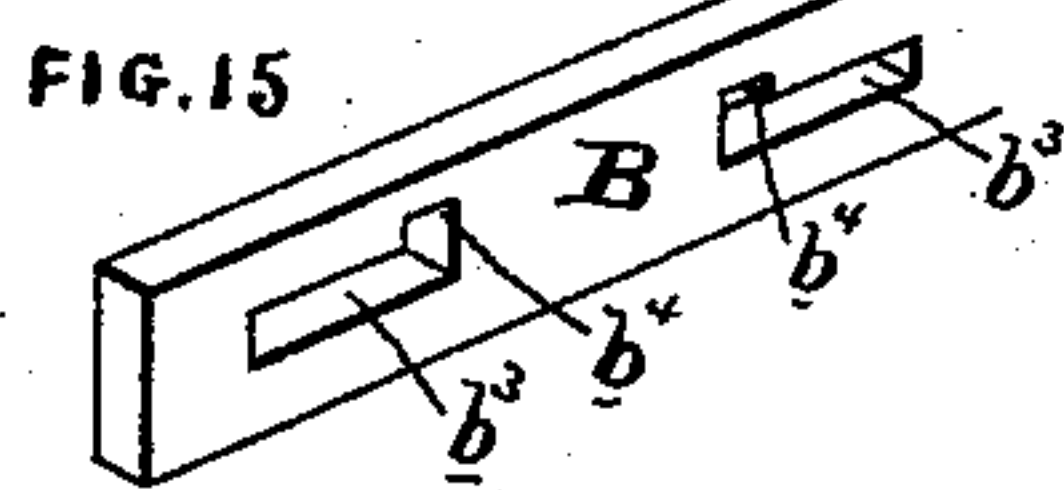
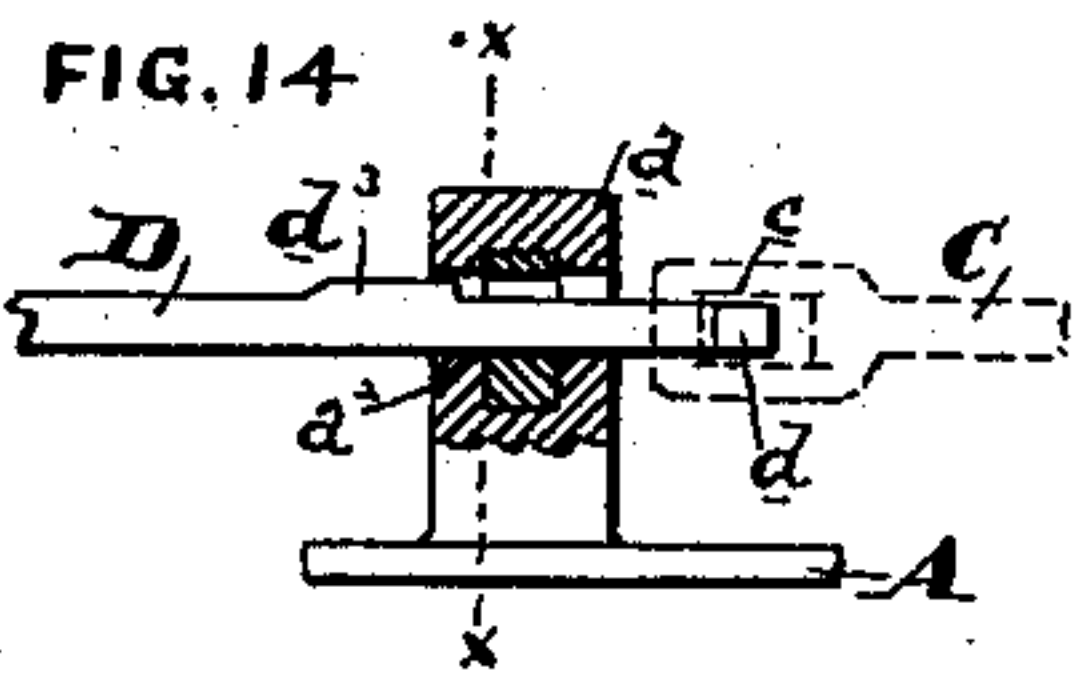
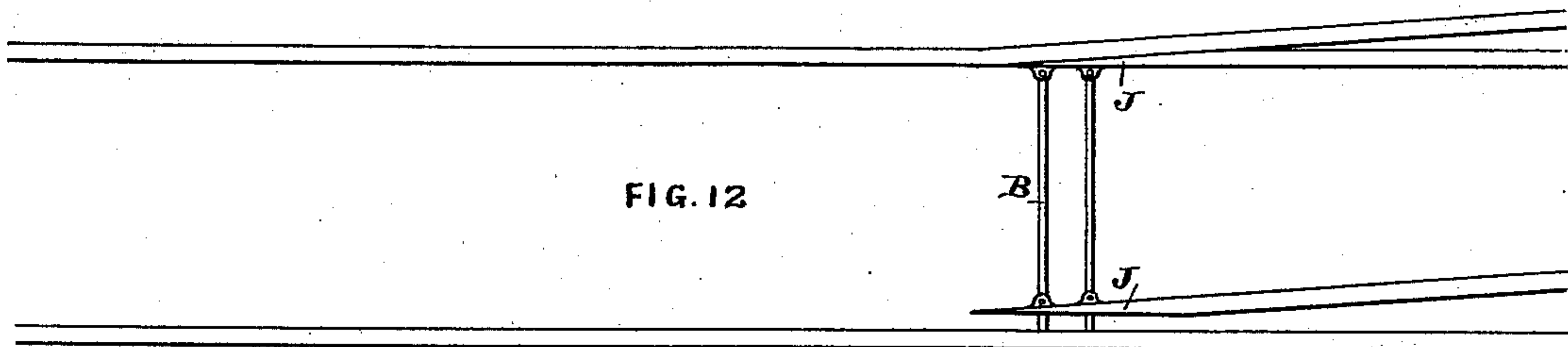
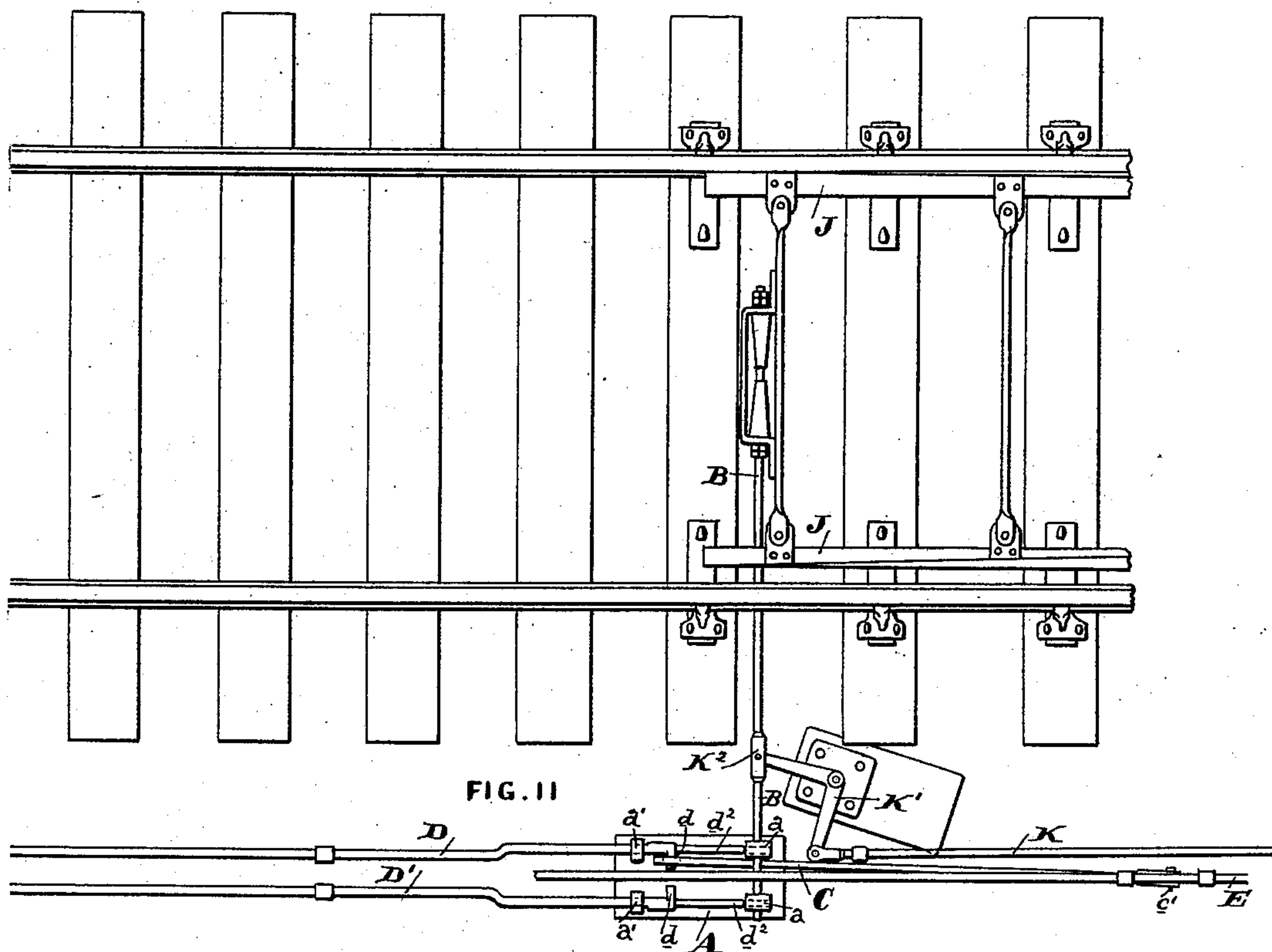
3 Sheets—Sheet 3.

G. D. FOWLE.

INTERLOCKING SWITCH AND SIGNAL.

No. 389,558.

Patented Sept. 18, 1888.



Attest:
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Joshua Matlack, Jr.

Inventor:
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by his attorney
Francis T. Chambers

UNITED STATES PATENT OFFICE.

GEORGE D. FOWLE, OF PHILADELPHIA, PENNSYLVANIA.

INTERLOCKING SWITCH AND SIGNAL.

SPECIFICATION forming part of Letters Patent No. 389,558, dated September 18, 1888.

Application filed March 24, 1888. Serial No. 268,361. (No model.)

To all whom it may concern:

Be it known that I, GEORGE D. FOWLE, of the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Railway Switch and Signal Interlocking Apparatus, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to that class of switch and signal interlocking by which a single lever is made to actuate two or more signals by making the signal-connection dependent on the position of the switches connecting the various routes governed by said signals; and my object is to simplify, cheapen, and improve the mechanism by which the movement of the switch-rod is made to change the signal-connection, and to lock to "danger" the disconnected signals, reference being now had to the drawings, which illustrate my invention, and in which—

Figure 1 is a plan view of my improved interlocking device in the form in which I prefer to embody it; Fig. 2, a side view of the device shown in Fig. 1; Fig. 3, a plan view of the device shown in Fig. 1, with its component parts in a different position. Fig. 4 is a sectional view on the line xx of Fig. 1. Fig. 5 is a diagram illustrating the position of my device with respect to the signals and signal-actuating lever. Figs. 6 to 9 are diagrams illustrating the useful application of my device to a certain plan of connected tracks. Fig. 10 illustrates a simple modification of the device used for engaging the signal-lever with one of two signal-connections. Fig. 11 is a plan view showing my interlocking device combined with a switch in the manner in which I prefer to use it. Fig. 12 shows a modification of my invention. Fig. 13 is a view, partly in section, showing the relative arrangement of the switch-bar, its supporting-guides, and the rods $D D'$ as they are in Fig. 12. Fig. 14 is a sectional view on the line yy of Fig. 13, and Fig. 15 is a perspective view of the switch-bar as constructed for use with the arrangement shown in Fig. 12.

A designates the base-plate, on which my device is preferably supported, but which is obviously not an essential feature of my invention.

$a a$ are supporting-guides for the switch-bar, and are preferably pierced with holes a^2 at right angles to the line of said switch-bar, as shown.

$a' a'$ are supports for the ends of signal-connections $D D'$, &c. I prefer to use the base A, and make the supports $a a'$ integral with it, as shown.

B is the switch-bar—that is, it is a bar so connected with the switch that it will move backward and forward with the switch, its end being made flat and passing through the supporting-guides $a a$, as shown. I prefer to make the switch-bar B of a single iron bar, connected with the switch at one end, and resting in the supporting-guides $a a$ at its other end, and to actuate the switch through said bar, as is shown in Fig. 11, placing the actuating-crank K' on the same side of the switch as the interlocking device.

b is a hole formed in bar B at such a point that it will come directly opposite to a bolt, d^2 , on one of the signal-connections $D D'$, &c., when the switch is in one of its fixed positions, a second hole, b' , being formed at a point which will cause it to be in line with another similar bolt when the switch is in its other position.

b^2 is a third hole, formed in bar B midway between holes b and b' .

C is a link, forming a part of the signal-actuating line, and preferably secured to the part of the line leading to the operating-lever by a pivoted connection, c' . This link passes through the hole b^2 in switch-bar B, and has at its front end an eye, c ; or instead of the eye a hook might be used—as, for instance, by omitting the lower side of loop c between the dotted lines $c^2 c^2$ —and of course the hooks may be placed on bar C, as is shown at $c^3 c^3$, Fig. 10, and eyes $d^1 d^1$, formed in bars $D D'$ to engage said hooks.

$D D'$, &c., are continuations of the signal-line, two of them being provided, each leading to a different signal for each link C employed in the system. These bars pass through and are supported by supports a' , each pair, as $D D'$, having hooked ends d or eyes d^1 . d' in each case is a shoulder which prevents the rod $D D'$, &c., from being drawn too far forward through its support a' , and d^2 is a bolt secured on the end of each rod $D D'$, &c.

E designates the part of the signal-connection leading directly to the operating-lever F.

G, Fig. 5, shows the connection between one of the rods D D', &c., and its signal, here marked S¹.

1, 2, 3, 4, 5, 6, 7, and 8, in Figs. 6 to 9, each designate a line of railway-track, the normal direction of travel on which is indicated by the arrows.

S, S², S³, S⁴, and S⁵ indicate signals governing the lines of track, and which are actuated by my device in the way hereinafter explained.

In Fig. 11 I have shown the interlocking device combined with a switch (marked J J) in the way I prefer to arrange it—viz., with the switch-bar B constituting a part of the rod or bar by which the switch is moved, and with the actuating-lever K' attached to it on the same side of the switch as the interlocking frame. K² in this figure indicates the point of attachment of bar B and lever K', and K is the switch-actuating connection. My reason for preferring this mode of uniting the switch and signal interlocking device with the switch is, that it absolutely insures the movement of the bar B with the switch, since it is only by bar B that the switch can be moved, and there is no joint of any kind between the switch and the frame.

In Figs. 12 to 15 I have shown a modified construction of the interlocking frame, in which the switch-bar B is arranged with respect to the switch J J and the signal-rods D D' in the same way as is shown in Fig. 11; but a separate bar, B², actuated by the switch, is employed to move the link C and cause it to engage the hooks on rods D D'. In this construction the bar B is slotted, as at b³ b³, and the rods D D' made to pass through said slots, which are provided with enlargements b⁴ b⁴, a corresponding shoulder, d³, being formed on each rod D or D' to serve as a lock to prevent the rods from being drawn back, except when the bar B is moved so as to bring the enlargement b⁴ in front of said shoulder when the rod so situated can be drawn back by link C.

My preferred device is put together as follows: The bar B, leading from a switch and preferably forming part of the switch-actuating rod, is inserted in the supporting-guides a a, as shown, and the link C is secured in its hole b² and pivoted to the end of the connecting-line leading from the lever F. The bars D D' are then secured in supports a', as shown, so that their hooked ends d will be opposite to the eye c of bar C, and their bolts d² d² opposite to holes b and b', respectively, in the alternate positions of bar B, and preferably I place the supporting-guides a a in front of bolts d² d², and perforate them, as at a², so that bolts d will pass through holes a² and b or b' at the same time, this construction being obviously one by which greater strength and rigidity is secured. Where I desire to actuate more than two signals by the lever F, I connect links C to the ends of bars D D', as is shown in Fig. 6, and combine these links with a second switch-

bar, B', and with additional bars, D², D³, D⁴, and D⁵, as is indicated. The arrangement being substantially identical with that already described, need not be again explained; but, as will at once be seen, I thus make it practicable to actuate any one of four signals by the single lever F, and of course any desired number may be similarly connected.

Where the modified device of Figs. 12 to 15 is used, the link C is connected with bar B² in the same way as in the preferred construction it is to bar B, guides a³ a³ being of course provided for bar B², and the rods D D' are caused to interlock with bar B in the manner described, this device being like the other in the main feature of my invention, in that the solid unjointed switch-actuating bar is made to interlock directly with the rods D D', which actuate the signals.

The operation of my device is readily followed on the drawings. Thus in Fig. 1 the bar B is thrown over so that the eye c of pivoted link C, which of course moves with it, is over and around the hook d of rod D, the hole b being opposite to the bolt d² of rod D, and in my preferred construction, as shown, in line with the hole a² in the support a. If, now, the line E is acted on by lever F, the rod D will be drawn back, its bolt d² passing through the hole b and locking the switch connected with switch-bar B in position as long as the bar D is in its backward position and its controlled signal (S², for instance) at "safety." At the same time it will be noticed that the solid part of switch-bar B is in front of the bolt at d² of rod D', so that this rod and its attached signal-actuating line cannot be drawn back at all. In Fig. 3 I have shown the switch-bar in the opposite position to that shown in Fig. 1, and have illustrated the device in the position in which it is in when the rod D' has been drawn back by the action of connection E on pivoted link C. The change in position of bar B throws the eye c of link C over one hook d or the other, and at the same time brings the holes b or b' in line with the connected rod D or D', rendering it feasible to move said rod and its signal. It will be observed that as the holes b or b' only register with bolts d² of rods D or D' when the bar B is in a certain position, the fact that the lever will actuate a signal absolutely assures the operator that the governed route is correctly set, especially when the bar B constitutes a part of the solid switch-actuating rod. The operation of the modified device of Fig. 12 is in all respects the same, save that the link C is moved by the separate bar B² instead of by bar B.

In the diagrams, Figs. 6 to 9, I have illustrated the application of my device to one side of a system of eight connected tracks, showing how a single signal-lever may be by its means made to give the necessary signals. Thus, in Fig. 6 the switches are set to enable a train to run from track 4 to track 8, the position of the switches moving switch-bars B and B' so as to connect link C, rod D, link C', and

rod D^2 , which rod connects with signal S^2 , which governs this route.

In Fig. 7 the switches are set to enable a train to run from 4 to 6. This necessitates a movement of bar B, which results in connecting link C with bar D' , link C^2 , and bar D^4 , through which signal S^4 , governing this route, is actuated.

In Fig. 8 the route is from track 2 to track 8. To get this route we move bar B back to the position occupied in Fig. 6 and change the position of bar B' , the result being that link C now connects through rod D, link C' , and rod D^3 with signal S^3 , governing this route; and in Fig. 9 the route from 2 to 6 is set by again moving bar B, which results in connecting link C through rod D' , link C^2 , and rod D^5 with signal S^5 , governing this route.

The signals S are used to regulate backward movement on the tracks, and are not a part of the system here shown.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is--

1. In switch and signal interlocking apparatus, the combination of a switch-bar, B, having bolt-holes $b b'$, arranged as specified, a link, C, connected with said switch-bar midway between bolt-holes $b b'$ and actuated by said bar, said link having an eye, c , or its equivalent, and rods $D D'$, having hooks d , and bolts d^2 , extending beyond said hooks and adapted to enter the holes $b b'$ in switch-bar B when said bar is in proper position, said link and rods being in normal position so situated that the link C will engage one rod or the other, according to the position of the switch-bar, substantially as and for the purpose specified.

2. In a switch and signal interlocking apparatus, the combination, with supporting-guides $a a$, having holes a^2 formed through them, of a switch-bar, B, having bolt-holes $b b'$ placed so that one of them will register with a hole, a^2 , in one of guides a in each position of said bar, a link, C, connected with bar B midway

between the holes $b b'$ and actuated by said bar, as specified, an eye, c , or its equivalent, on the end of link C, rods $D D'$, and bolts d^2 , arranged in line with the perforations a^2 in supporting-guides $a a$, the link C and rods $D D'$ being so arranged that in normal position the movement of bar B will cause the link to engage one of said rods, all substantially as and for the purpose specified.

3. In a switch and signal interlocking apparatus, the combination, with supporting-guides $a a$, having holes a^2 formed through them, of a switch-bar, B, having bolt-holes $b b'$ placed so that one of them will register with a hole, a^2 , in one of guides a in each position of said bar, a link, C, connected with bar B midway between the holes $b b'$ and actuated by said bar, as specified, an eye, c , or its equivalent, on the end of link C, rods $D D'$, supported on supports $a' a'$, bolts d^2 , arranged in line with the perforations a^2 in supporting-guides $a a$, and shoulders d' , the link C and rods $D D'$ being so arranged that in normal position the movement of bar B will cause the link to engage one of said rods, and the shoulders d' being so placed with respect to supports a' that they will stop the rods $D D'$ from moving too far forward, all substantially as and for the purpose specified.

4. In switch and signal interlocking apparatus, the combination of a switch-bar, B, consisting of an extension of a solid unjointed switch-actuating rod, the rods $D D'$, arranged to interlock with said switch-bar, so as to prevent it from moving when either of said rods is drawn back, the link C, and mechanism consisting of the bar B, or equivalent means, as specified, for actuating said link and causing it to engage rods D or D' , according to the position of the switch.

GEO. D. FOWLE.

Witnesses:

LISLE STOKES,
JOSHUA MATLACK, Jr.