

H. JOHNSON.

SIGNAL APPARATUS FOR RAILWAY POINTS, &c.

No. 342,911.

Patented June 1, 1886.

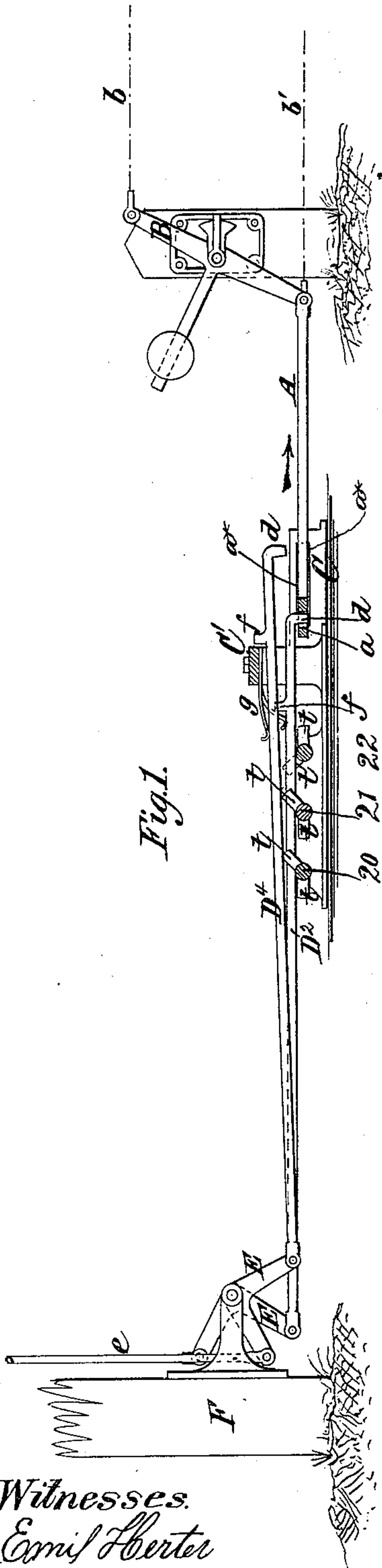


Fig. 1.

Fig. 2.

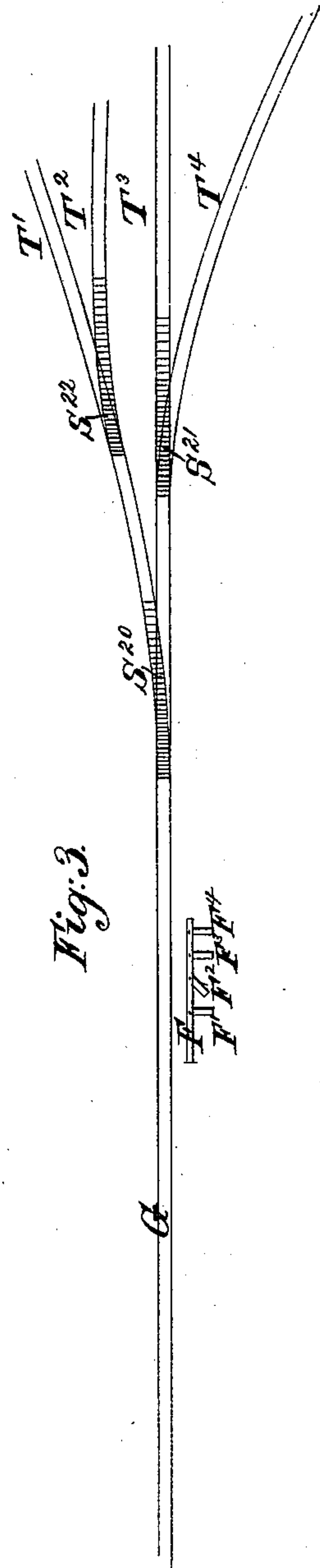
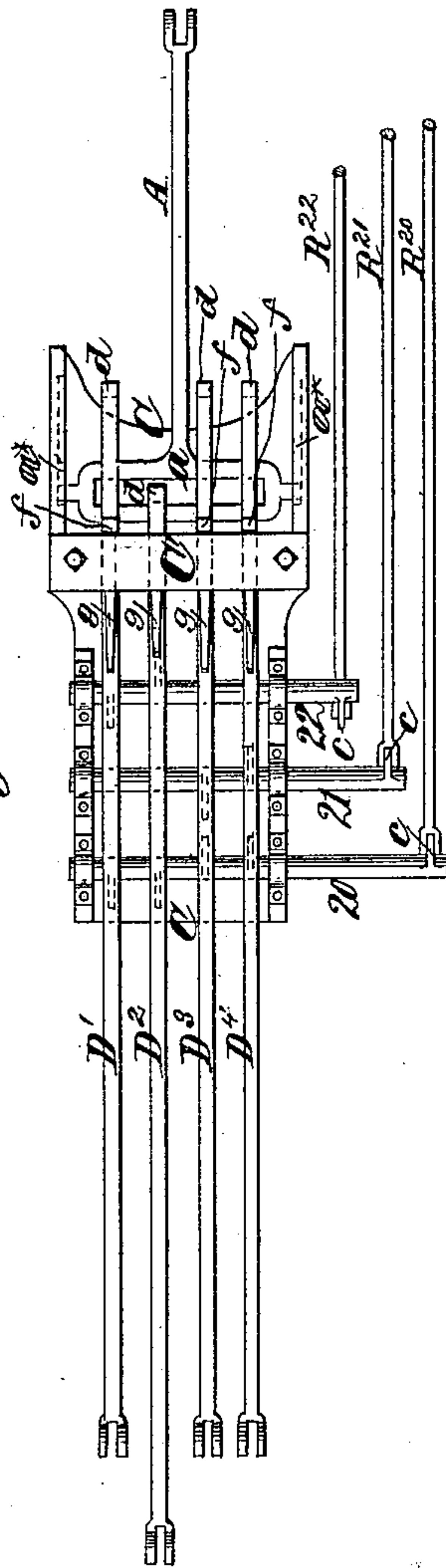


Fig. 3.

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O. Sundgren.

Inventor.  
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(No Model.)

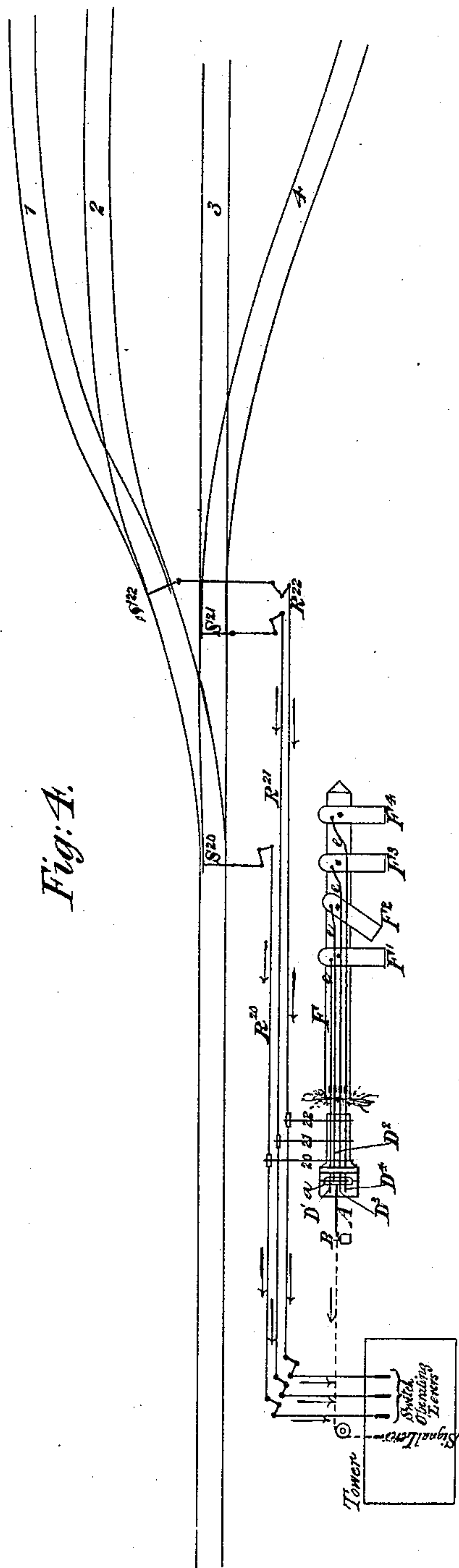
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Brown & Hall.



# UNITED STATES PATENT OFFICE.

HENRY JOHNSON, OF THE WILLOWS, FLIXTON, COUNTY OF LANCASTER,  
ENGLAND.

## SIGNAL APPARATUS FOR RAILWAY-POINTS, &c.

SPECIFICATION forming part of Letters Patent No. 342,911, dated June 1, 1886.

Application filed February 24, 1886. Serial No. 193,080. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY JOHNSON, of "The Willows," Flixton, in the county of Lancaster, England, have invented a new and  
5 useful Improvement in Signal Apparatus for Railway Points and Switches, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to apparatus through  
10 which one or more switches controlling two or more tracks or routes are made to control at the same time the signals for said tracks or routes.

The invention, though applicable with ad-  
15 vantage in connection with two signals and a single switch controlling only two routes, is more especially intended for controlling a larger number of signals for a corresponding number of routes, and is intended to insure a  
20 very positive operation of any number of signals, and particularly to insure the positive locking of every signal of a system in such manner that neither one can be moved by taking hold of the signal itself or its immediate  
25 connections, or without the knowledge of the operator in the tower or other place where the entire system is to be controlled; and the invention consists in certain combinations, hereinafter described and claimed, of switches and  
30 signals and mechanism for operating and controlling the signals whereby the desired results are accomplished.

Figure 1 in the drawings is a side view of the mechanism for operating and controlling  
35 four signals belonging to as many tracks or routes controlled by three switches. Fig. 2 is a plan of the principal portions of said mechanism. Fig. 3 is a diagram exhibiting a main track and four routes therefrom and a signal-  
40 post, and the four signals belonging to the said tracks. Fig. 4 is a diagram giving a general view of the tracks, switches, signals, and the apparatus for operating the switches and signals, to illustrate the application of the inven-  
45 tion.

Similar letters of reference indicate corresponding parts in the several figures.

Referring, first, to Figs. 1 and 2, A designates a rod, through which all of the signals  
50 are to be operated, the said rod being intended to be operated by any positive and perma-

nent connection with the lever worked by the signal-operator in the tower or other place where all the signals in the system are to be  
55 operated. The said rod is represented in Fig. 1 as connected at one end with a balance-lever, B, working on a fixed fulcrum and having front and back connections, *b b'*, with the lever in the tower. The other end of the said  
60 rod is constructed or provided with a slotted cross-head or transverse link, *a*, the ends of which work in horizontal guides *a\** in the cheeks of a bed-plate, C, which supports all the principal parts of the signal-controlling  
65 apparatus. The said cross-head or link is intended to receive and engage with the hooked end *d* of either one of a series of bars, *D' D<sup>2</sup> D<sup>3</sup> D<sup>4</sup>*, corresponding with the number of the  
70 signals to be operated, the other end of each of said bars being connected with its respective signal by any suitable means—as, for instance, by one of a corresponding number of elbow-levers, E, at the foot of the signal-post  
75 F, and rods *e*, between said levers and the signals. Only one of the signal-connecting bars *D' D<sup>2</sup> D<sup>3</sup> D<sup>4</sup>* is at any time engaged and connected by its hook *d* with the link *a* of the rod A, and one should always be engaged there-  
80 with, the others being always lifted up and held out of engagement by means of toes or lifters provided on three rock-shafts, 20, 21, 22, which I term "lifters," which work in  
85 bearings in the bed-plate C, there being one of the said rock-shafts or lifters for each of the three switches *S<sup>20</sup> S<sup>21</sup> S<sup>22</sup>*, (indicated by shaded lines in Fig. 3,) which control the four tracks  
90 *T' T<sup>2</sup> T<sup>3</sup> T<sup>4</sup>*. The said switches are connected by rods *R<sup>20</sup> R<sup>21</sup> R<sup>22</sup>* with arms *c* on their respective rock-shafts for the purpose of turning  
95 said rock-shafts to produce the control by the switches of the connections of the different signal-connecting bars *D' D<sup>2</sup> D<sup>3</sup> D<sup>4</sup>* with the signal-operating rod A.

The rock-shaft or lifter 20, belonging to the  
95 switch *S<sup>20</sup>* in the line G, with which the four tracks *T' T<sup>2</sup> T<sup>3</sup> T<sup>4</sup>* are connected by the three switches, must be capable of controlling the signals of all the four tracks, and hence it is  
100 provided with four toes, *t*, as shown in dotted outline in Fig. 2, the said toes being so set that two of them may raise and lower the connecting-bars *D' D<sup>2</sup>* for the signals of the tracks



T' T<sup>2</sup>, and the other two may raise and lower the connecting-bars D<sup>3</sup> D<sup>4</sup> for the signals of their corresponding tracks, T<sup>3</sup> T<sup>4</sup>.

The rock-shaft or lifter 21, belonging to the switch S<sup>21</sup>, has two toes, *t*, one for raising and lowering the connecting-bar of the signal belonging to the track T<sup>3</sup>, and the other for raising and lowering the connecting-bar of the signal belonging to the track T<sup>4</sup>, and the rock-shaft or lifter 22, belonging to switch S<sup>22</sup>, has two toes for raising and lowering, respectively, the connecting-bars of the signals belonging to the tracks T' T<sup>2</sup>.

The signals are indicated by letters F' F<sup>2</sup> F<sup>3</sup> F<sup>4</sup> in Figs. 3 and 4.

The signal-connecting-bars are each furnished on its upper side with a projection, *f*. When either of said bars is held up and disconnected from the link of the signal-operating rod, which is always the case when the switches are not set for their respective tracks, the said projection stands in front of a stationary cross-bar or stop, C', secured to the bed-plate C, and so prevents the said bar from being moved in the direction of the arrow shown in Fig. 1, which is the direction required to move the signal to the "safety" position, and thereby always holds it in the "danger" position.

On the top of each signal-connecting bar is applied a spring, *g*, to assist the weight of the bars to bring their hooks *d* into engagement with the link *a* of the operating-rod A, when permitted to descend by the toes of the rock-shafts. When the bars drop into this engagement, their projections *f* are free to pass under the stop C'.

I will now explain the operation of the hereinabove-described apparatus. When the switch S<sup>20</sup> is set for the one side, it frees both connecting-bars D' D<sup>2</sup>. When set for the other side, it frees both bars D<sup>3</sup> D<sup>4</sup>. If it be desired to permit a train to go from G to track T<sup>2</sup>, the switch S<sup>22</sup> is set in the position shown by the shade-lines in Fig. 3, and so caused to actuate the rock-shaft 22 as to raise its left toe *t* and lower its right one, as shown in Fig. 1, so that it holds up the bar D', and would allow the bar D<sup>2</sup> to fall, were it not that the latter cannot fall until the switch S<sup>20</sup> is set toward that S<sup>22</sup>, as shown in Fig. 3. The setting of S<sup>20</sup> actuates the rock-shaft 20, and so raises its two right toes and at the same time depresses its two left ones, which latter release both the bars D' D<sup>2</sup>; but only bar D<sup>2</sup> can fall to engage with the link of the operating-rod A, because the left-hand lug *t* on the rock-shaft 22 still holds up the bar D'. If, now, the signal-operating lever in the tower or other place, in connection with the operating-rod, be pulled over or reversed, the rod A is pushed in the direction of the arrow shown in Fig. 1; but as all the connecting-bars are raised except D<sup>2</sup>, the latter only is moved by the rod A, and the signal F<sup>2</sup>, connected with said bar, is moved "off" or to the "safety" position, as shown in Fig. 3. When the operating-

lever is put back, the rod A is also pulled back in the opposite direction to the arrow shown in Fig. 1, and all is ready for a train to be signaled for any other of the routes or tracks T' T<sup>3</sup> T<sup>4</sup>, according to which of them is in communication by the switches with the track G, the switches always keeping disengaged all the signals except that one belonging to the track for which the switch is set, and enabling that signal to be brought to the "safety" position. This controlling mechanism, consisting of the rod A, with its link or slotted cross-head, the signal-connecting bars, and the rock-shafts, may be adapted to larger numbers of tracks, switches, and signals than are here shown for illustration. It will be understood that the number of connecting-bars will correspond always with the number of tracks to be signaled, and the number of rock-shafts will always correspond with the number of switches, the number of toes on the first rock-shaft, as 20, being equal to the whole number of tracks to be signaled, and each of the other rock-shafts having a number of toes equal to the number of tracks which its switch controls. This controlling mechanism makes a practically-rigid connection between any one of a number of signals and a single lever or rod for operating them all. By it a positive movement is given to the signal, both to the "all clear" and "danger" positions, and no maliciously-inclined person can either raise or lower the signal from any point outside of the signal-tower or place from which it is intended to be operated. The projections *f* on the connecting-bars prevent a weighted signal from pulling back the said bars.

The controlling mechanism may be placed either near the signal-post or in front of the operating-tower or at any point between the post and tower, the connections to either being of suitable length.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a switch or switches controlling two or more railway-tracks and a number of signals, one for each of said tracks, of an operating-lever and connecting-link for working all of said signals, a series of connections, one for each signal, and a number of lifters corresponding with and connected with said switch or switches for producing or controlling the engagement and connection of either of said connections with said connecting-link and the disengagement of all the others, substantially as and for the purpose herein described.

2. The combination, with two or more tracks and a signal for each, of a lever and a link-connection for operating all of said signals, a series of connecting-bars, one for each signal, one or more switches for controlling said tracks, a number of rock-shafts, one for each switch, provided with toes to operate on said connecting-bars, and a connection between each rock-shaft and its respective switch, substantially as herein described, whereby the



movements of the switches are caused to produce the connection and disconnection of said connecting-bars and link-connection, as and for the purpose herein set forth.

- 5 3. The combination of a signal-operating lever and a connecting-link, *a*, two or more signals and corresponding attached connecting-bars for engaging with said link, lifters  
10 for lifting and holding said bars out of engagement from said link, and a fixed stop to operate against portions of said connecting-bars

while disengaged from said link, and thereby prevent the movement of the said disengaged connecting-bars in a direction to move their respective signals to the safety position, all substantially as herein described.

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Witnesses:

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J. W. STAFFORD,

*Clerks with Messrs. Ormerod & Allen, Solicitors,  
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