

No. 695,498.

Patented Mar. 18, 1902.

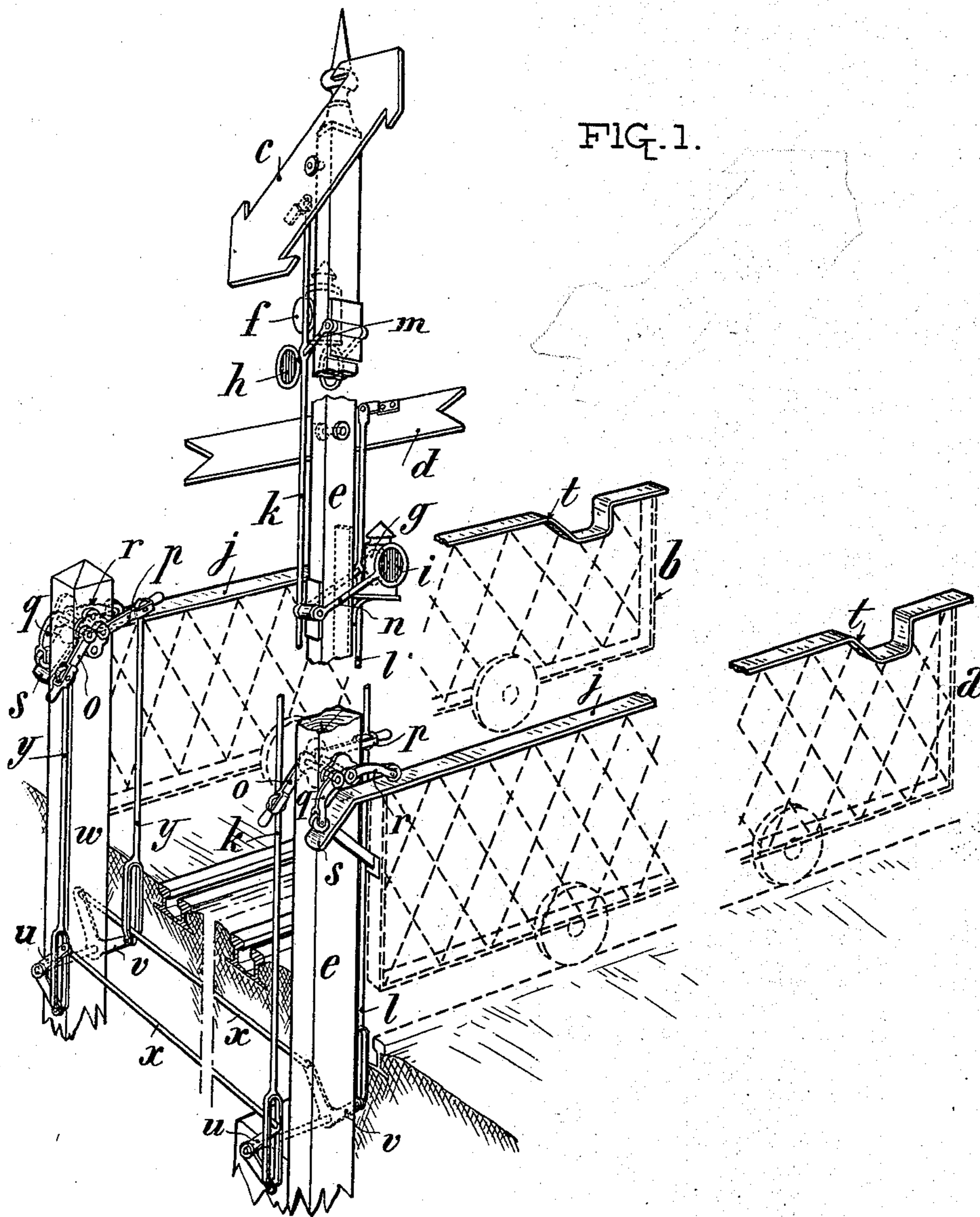
L. SÉMAT.

MEANS FOR OPERATING SIGNALS AUTOMATICALLY AT LEVEL CROSSINGS, &c.

(Application filed Jan. 2, 1902.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
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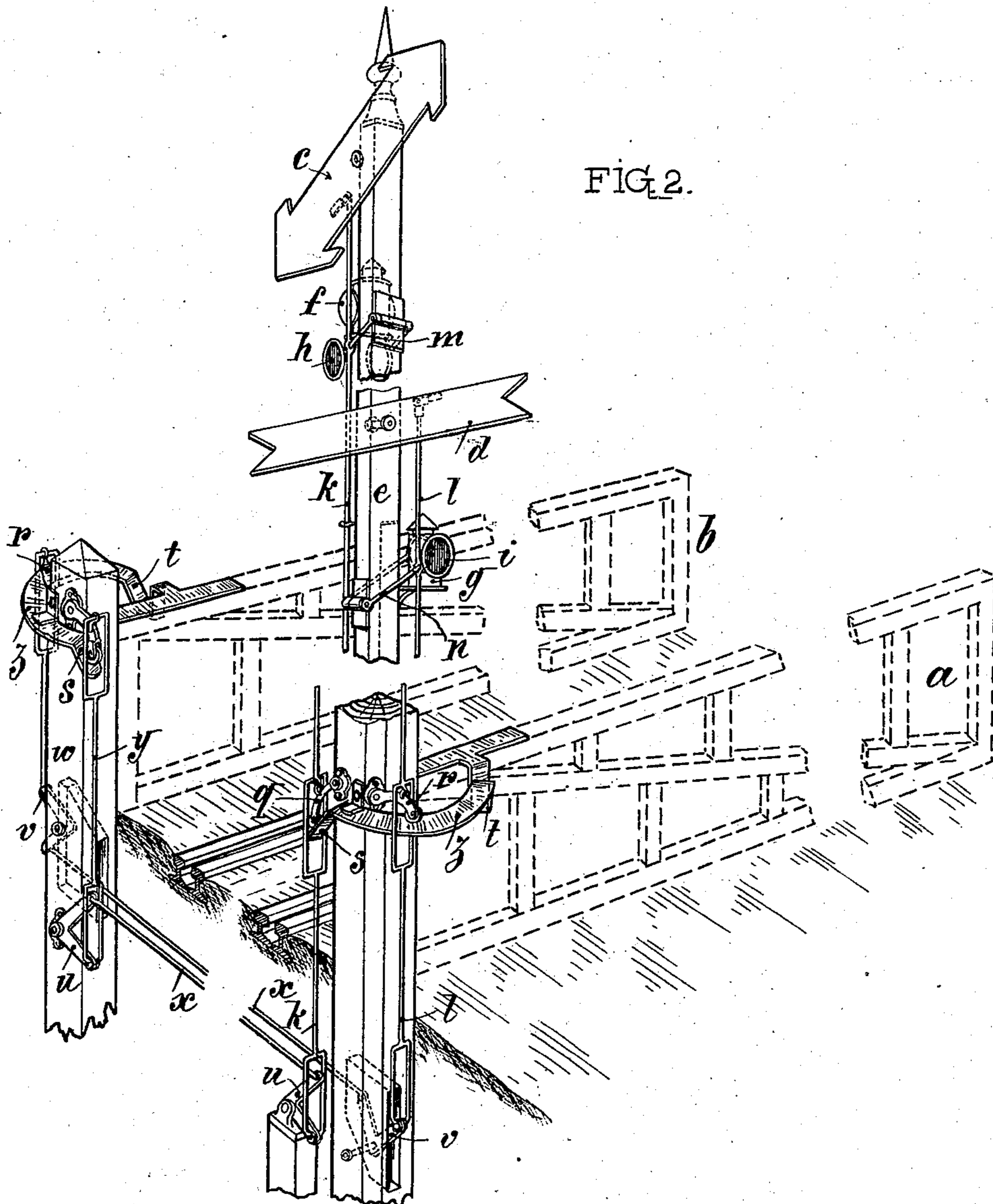
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# UNITED STATES PATENT OFFICE.

LAURENT SÉMAT, OF CAIRO, EGYPT.

MEANS FOR OPERATING SIGNALS AUTOMATICALLY AT LEVEL CROSSINGS, &c.

SPECIFICATION forming part of Letters Patent No. 695,498, dated March 18, 1902.

Application filed January 2, 1902. Serial No. 88,150. (No model.)

*To all whom it may concern:*

Be it known that I, LAURENT SÉMAT, a citizen of the Republic of France, residing at Cairo, Egypt, have invented certain new and useful Improvements in or Relating to Means for Operating Signals Automatically at Level Crossings and the Like, (for which I have made application for Letters Patent in France, No. 312,979, dated July 25, 1901; in Germany, dated July 30, 1901; in England, dated July 29, 1901; in Belgium, dated September 16, 1901; in Austria, dated September 18, 1901; in Spain, dated October 26, 1901; in Russia, dated October 24, 1901, and in Italy, dated November 5, 1901,) of which the following is a specification.

The present invention relates to means for automatically working the signals in connection with the gates or barriers of a level crossing or the like. According to this invention the barriers, whether they slide in grooves or turn on hinges, automatically operate the signals when they are opened or closed.

In the accompanying drawings, Figure 1 is a perspective view of a sliding gate or barrier to which my invention is applied. Fig. 2 is a similar view to Fig. 1 of the invention applied to a barrier turning on hinges.

My invention consists in placing on one of the uprights of one of the barriers a signal visible during the day and a lamp or night-signal, these signals being so arranged that they occupy ordinary positions which indicate, respectively, whether the road is clear or not. The operation of the signals takes place automatically and in such a manner that, first, when the two barriers are completely open for traffic across the track the railway-signal indicates "danger" for the railroad, while the signal for the road indicates "way clear." This last indication is only shown when both barriers are completely open; second, when either of the two barriers begins to close the railway-signal remains at "danger," while the road-signal immediately comes to the danger position; third, when the two barriers are completely closed the railroad-signal indicates "way clear" and the signal for the road continues to indicate "danger;" fourth, when one or both of the barriers begins to open for the road the railway-signal immediately changes to "danger,"

the road-signal still indicating "danger" until the barriers are completely open. In the example represented in the drawings the day-signals, which indicate these various situations, are formed of movable arms *c* and *d* of suitable form, which are pivoted on the upright or post *e*, which has the form of a mast, near one of the barriers *a*, (or *b*.) These arms are secured on the post at a certain angle with regard to each other—i. e., facing their respective roads—so that one of them, *c*, may be visible from the railroad, while the other, *d*, is visible from the roadway. These arms are movable vertically about their axes, so that they indicate "danger" when they are horizontal and "way clear" when they are inclined. The night-signals are given by the light of lanterns *f* and *g*, with any system of lighting, arranged, like the arms *c* and *d*, facing their respective roads. In front of these lanterns operate, according to the positions of the barriers, red glasses *h* and *i*. The white light of the lantern indicates that the way is clear and the red light that the way is obstructed. The operation of these signals being automatically effected by the barriers, it would be impossible without damaging the apparatus to make the signals indicate other situations than those indicated by the four phases cited above, with the exception of the situation "danger," which could in case of necessity be indicated by hand by an official at the barrier, even at a moment when the position of the gates would normally cause the apparatus to indicate "way clear." This can be done in case of a breakdown or other obstruction on the railroad or for any other cause.

The operation of the signals is effected by intermediate devices between the barriers and the signals and the construction of which is the same for a sliding barrier as for a barrier turning on hinges. These devices consist of vertical rods *k* and *l*, the upper ends of which are respectively attached to the signal arms or semaphores *c* and *d* at a certain distance from the pivot of said arms. Each rod *k* *l* has an eye or loop through which one arm *m* *n*, respectively, of double-armed or U levers pass, the latter being hinged to the post *e*, and carry at their free ends red glasses *h* and *i*. The connection thus established between the

rods  $k$  and  $l$  and the day and night signals assures the simultaneous operation of these signals, so as to make them produce the same indications, respectively, for the same road  
 5 or track. When the system is applied to sliding barriers, as represented in Fig. 1, the rods  $k$  and  $l$  are connected again near the upper level of the corresponding barrier to levers  $o$  and  $p$ , which in their turn are fixed to  
 10 pivots secured to the post  $e$ . These pivots carry at their other ends other levers  $q$  and  $r$ , provided, preferably, with rollers. When the system is applied to barriers turning on hinges, the rods  $k$  and  $l$  are connected di-  
 15 rectly with the levers  $q$  and  $r$ .

It will be seen from the above that the working of the signals is dependent as much on the movement of one of the barriers as on that of the other and that the signals are only  
 20 respectively in their opposite positions when both barriers are either completely open or completely closed. For this purpose the levers  $q$  and  $r$  are united by their axles to the levers  $o$  and  $p$ , arranged similarly to them on  
 25 the post  $e$  and symmetrically on the opposite post  $w$ . Each pair of levers  $o$   $q$  and  $p$   $r$  on the post  $e$  is connected to the pair on the other post  $w$  by the prolongation of the rods  $k$  and  $l$ , jointed to angle-levers  $u$   $v$ , which transmit  
 30 the movement to other angle-levers similar to  $u$   $v$  on the post  $w$ , rods  $y$   $y$  uniting the levers  $u$  and  $v$  of the post  $w$  to the corresponding levers  $o$  and  $p$ .

The working of the mechanism is effected  
 35 by the opening and closing movement of the barriers. To this end these barriers are provided with slightly-different devices, according to whether they are sliding or hinged barriers. Taking for example the sliding  
 40 barriers illustrated in Fig. 1, the upper longitudinal portion  $j$  of each of the barriers  $a$  and  $b$  is formed in such a manner as to provide at the beginning and end of its course inclined surfaces  $s$  and  $t$ , connected by a flat  
 45 straight surface. As regards the barriers turning on hinges, in which the movement of opening and closing takes place by rotation of these barriers around their posts, the upper portion  $j$  of the sliding barriers is replaced  
 50 by a curved surface somewhat in the form of a sector  $z$ , fixed at one of its ends to the upper part of the barrier and extending around the post, having as its center the pivot of the barrier. This sector  $z$  has, like the plate  $j$ ,  
 55 curved or bent surfaces  $s$  and  $t$ , which are united by a straight flat portion to produce the same effects as the surfaces  $s$  and  $t$  of the sliding barriers. In both types of barrier represented in Figs. 1 and 2 when the barriers  
 60 are completely closed, thus barring the way to road traffic, the roller of the lever  $q$ , which operates the railway-signals, rests on the lowermost part of the inclined surfaces of the plate  $j$  or  $z$ , according to the type of barrier  
 65 employed. The lowered lever  $q$  thus allows the rod  $k$  to descend, and with it the day-signal  $c$  and night glass signal  $h$  are lowered

to indicate that the railroad is free. During this movement the roller of the lever  $r$ , on the contrary, rests on the straight part of  
 70 the plate, which thus keeps it in its raised position, so that the rod  $l$  and signals  $d$  and  $i$  indicate that the road is barred to pedestrians and vehicles. When one of the barriers is operated—the barrier  $a$ , for exam-  
 75 ple—in opening and as soon as it begins to move, the inclined surface  $s$  raises the lever  $q$  and causes the signals  $c$  and  $h$  of the railroad to occupy the position which indicates that the line is not free, this taking place before  
 80 the road-signals indicate that the road is free. This last operation is effected by means of the interconnection of the similar operating mechanism of the two barriers.

It has been stated that, the barriers being  
 85 closed, as soon as one of them is moved to be opened the corresponding lever  $q$  is lifted by the inclined surface  $s$ , thus causing the signals  $c$  and  $h$  immediately to indicate "danger" for the line. During this movement the  
 90 lever  $r$  is sustained in its raised position by the horizontal part  $j$ , so that the signals  $i$  and  $d$  indicate at the same time "danger" for the road. It is only when the first barrier operated brings its inclined surface  $t$  under the  
 95 lever  $r$  that this lever can drop under its own weight; but this dropping of the lever  $r$  can only take place simultaneously with that of the similar lever  $r$  of the other barrier  $b$ , which movement cannot take place until this  
 100 barrier  $b$  brings in its turn its inclined surface  $t$  under the corresponding lever  $r$ —i. e., when the said barrier is completely open. Only then will the rod  $l$  be operated by the  
 105 simultaneous fall of the two levers  $r$  to indicate that the road is free. This movement being reciprocal for the one as for the other of the barriers, the same operations are effected when one or the other barrier begins to open.

It is evident that the signals can be in the form of disks and, if desired, be operated pivotally by means of the device described suitably adapted for the purpose desired. Moreover, a single lamp could, if necessary, be  
 115 used to indicate the luminous signals on the four sides. Further, by means of suitable transmission devices or connections similar signals to those on the barrier can be repeated on posts placed at a distance from the cross-  
 120 ing. Such additional signal would of course only be used for the railroad, and in this case only a railway-track signal would be operated.

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

1. An automatically-acting signal system for railway level crossings and the like comprising a double mechanism operated by the  
 130 movement of the barriers in opening and closing, the said mechanism consisting of a signal for the railway-track and a signal for the roadway, a plate on the barrier having inclined portions at predetermined points and

pivoted levers resting upon said plate and connected to their respective signals, substantially as set forth.

2. A device of the kind described comprising a railway-track signal and a roadway-track signal, a plate on one barrier having inclined portions at predetermined points, pivoted levers resting on the plate and rods connecting the levers to their signals, and  
10 means for transmitting the action of one set

of levers to similar levers of a second plate on the second barrier substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of 15 two subscribing witnesses.

LAURENT SÉMAT.

Witnesses:

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R. H. BLANCHARD.