G. P. KEITH.

RAILROAD CROSSING.

APPLICATION FILED JUNE 20, 1907. RENEWED NOV. 24, 1908.

911,997.

Patented Feb. 9, 1909.

3 SHEETS—SHEET 1.

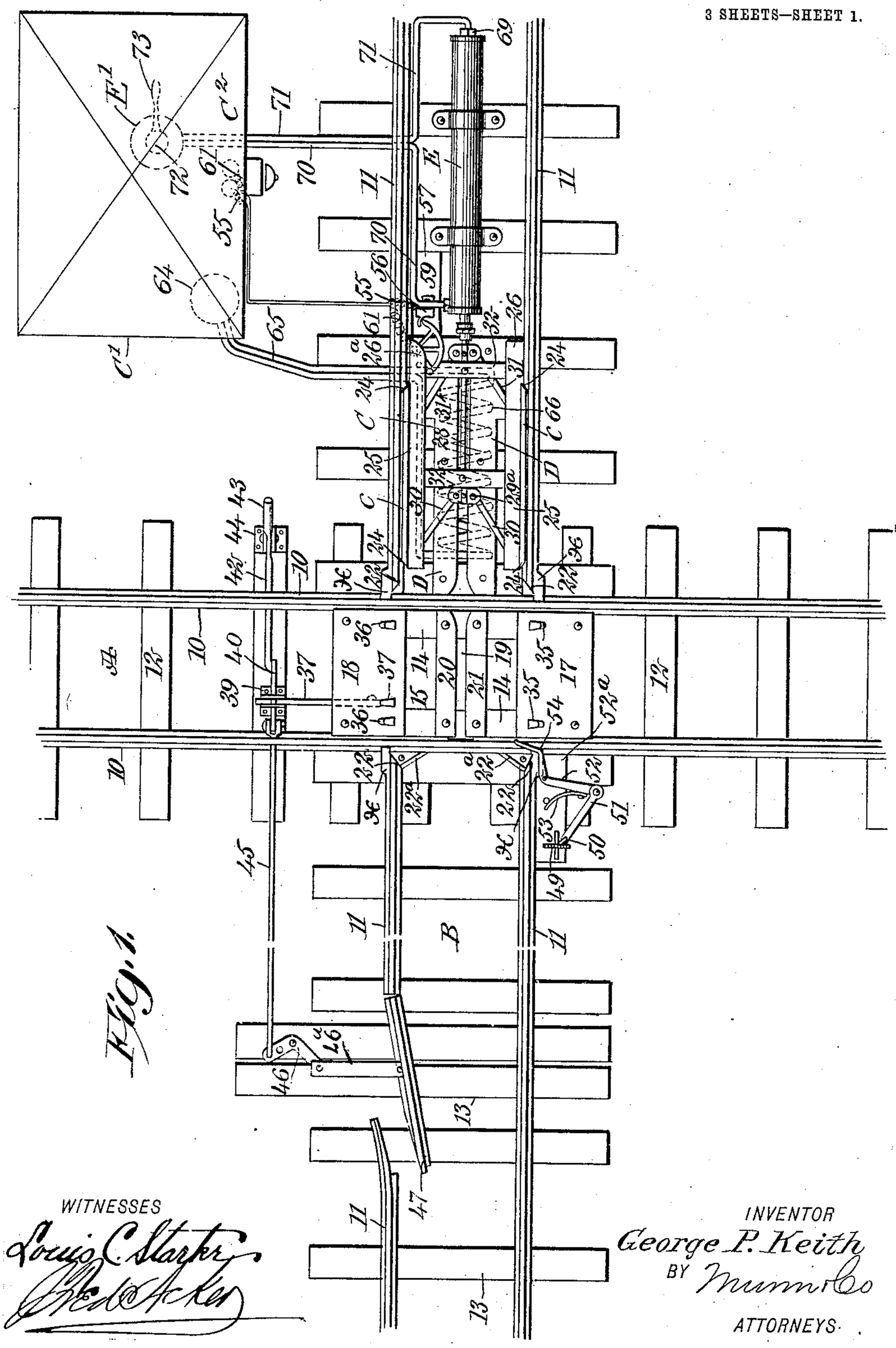

Fig. 1.

WITNESSES

Louis C. Starker

H. C. Acker

INVENTOR

George P. Keith

BY Munn & Co

ATTORNEYS.

G. P. KEITH.

RAILROAD CROSSING.

APPLICATION FILED JUNE 20, 1907. RENEWED NOV. 24, 1908.

911,997.

Patented Feb. 9, 1909.

3 SHEETS—SHEET 2.

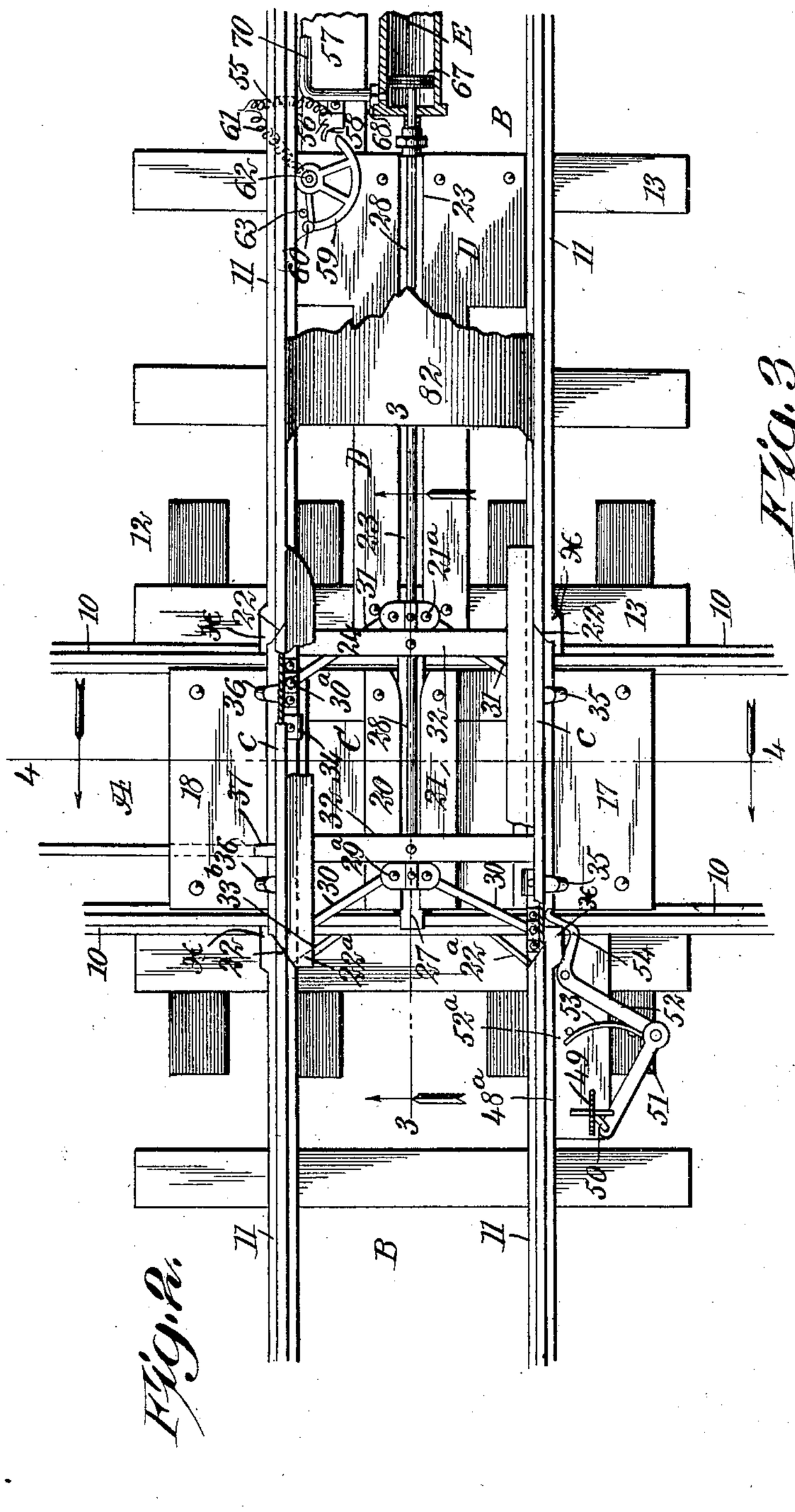

Fig. 2.

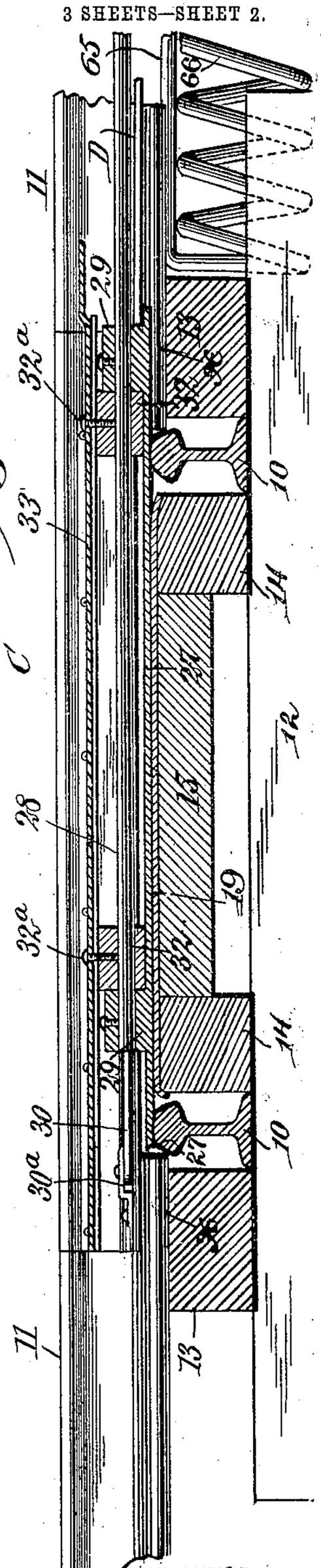

Fig. 3

WITNESSES

Louis C. Starke

J. Fred Acker

INVENTOR

George P. Keith

BY Munn & Co.

ATTORNEYS

G. P. KEITH.

RAILROAD CROSSING.

APPLICATION FILED JUNE 20, 1907. RENEWED NOV. 24, 1908.

911,997. Patented Feb. 9, 1909.

3 SHEETS—SHEET 3.

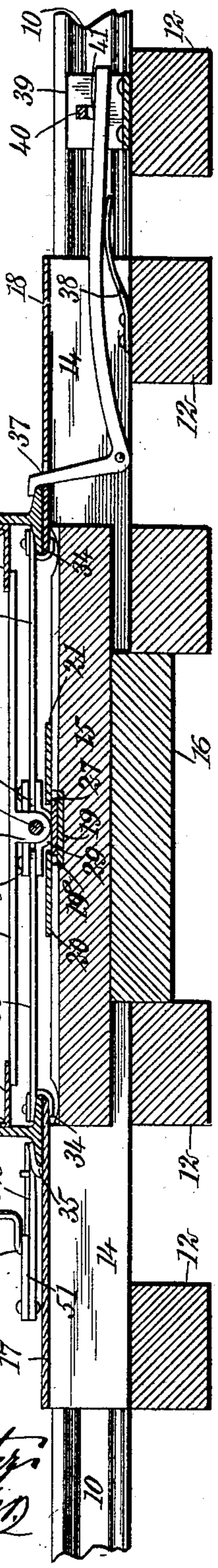

Fig. 4.

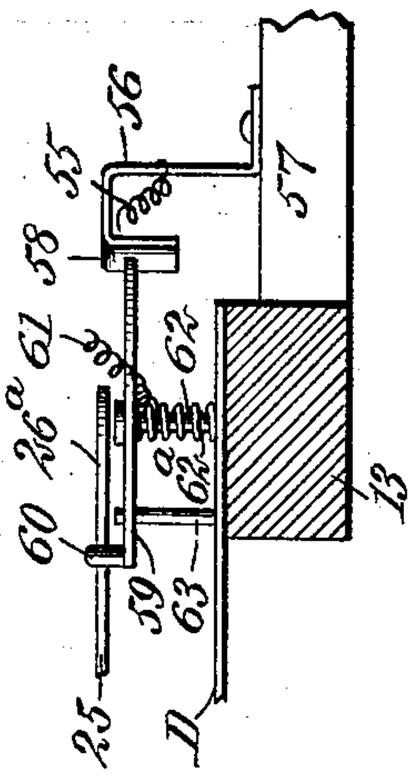

Fig. 6.

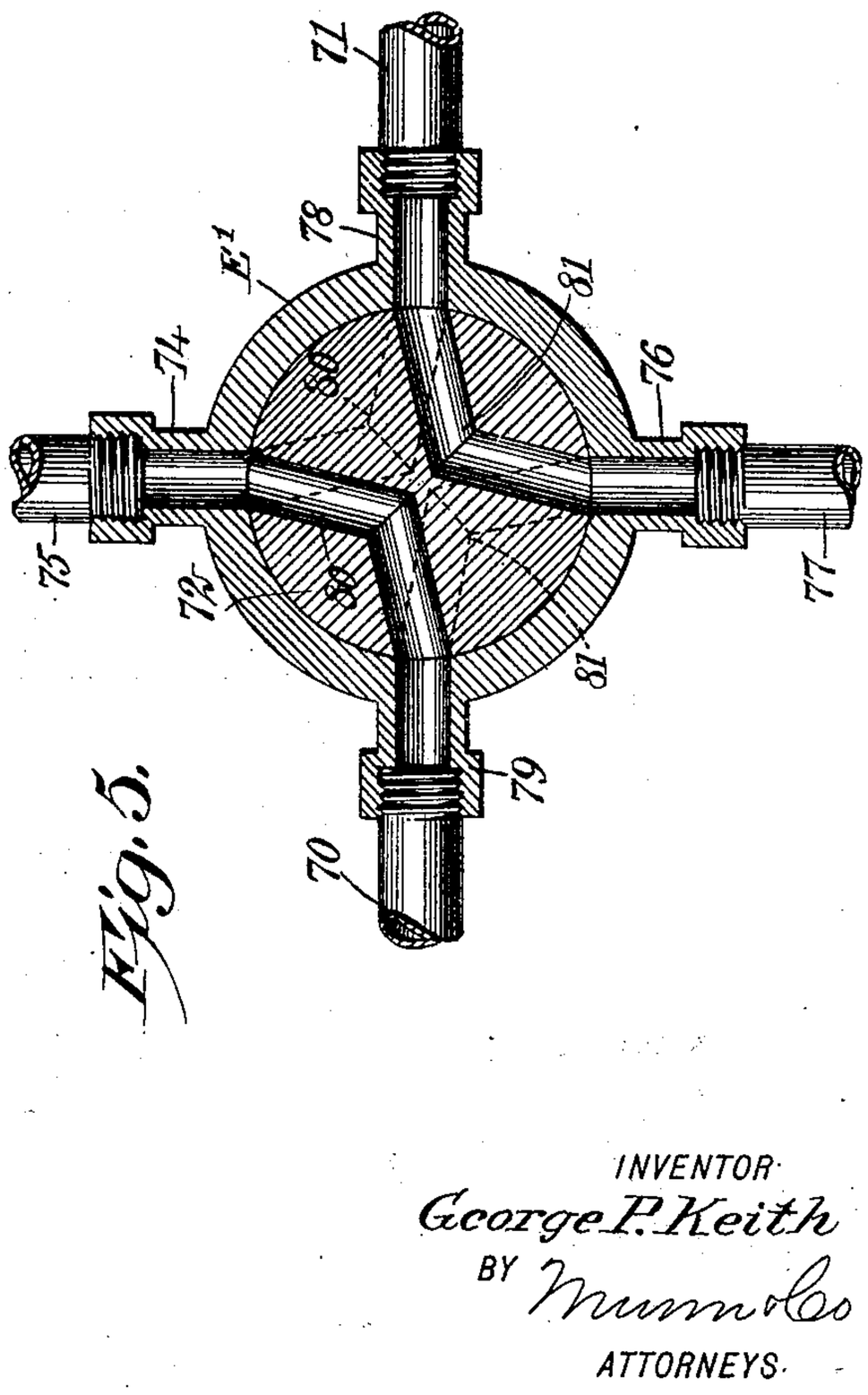

Fig. 5.

WITNESSES

Louis C. Stanley

J. Fred Acker

INVENTOR

George P. Keith

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

GEORGE PETER KEITH, OF ROCHESTER, INDIANA, ASSIGNOR OF ONE-FOURTH TO STELLA P. BAILEY, RINALDO P. TRUE, AND HENSON C. CONDON, OF ROCHESTER, INDIANA.

RAILROAD-CROSSING.

No. 911,997. Specification of Letters Patent. Patented Feb. 9, 1909.

Application filed June 20, 1907, Serial No. 379,908. Renewed November 24, 1908. Serial No. 464,287.

To all whom it may concern:

Be it known that I, GEORGE PETER KEITH, a citizen of the United States, and a resident of Rochester, in the county of Fulton and State of Indiana, have invented a new and useful Improvement in Railroad-Crossings, of which the following is a full, clear, and exact description.

The purpose of the invention is to provide a construction of railroad crossing that can be quickly and conveniently adapted for use in connection with an adjacent railroad crossing, without one interfering with the other, since the rails of one crossing are elevated above the rails of the other crossing, an opening of sufficient width being provided in the upper track to enable trains to pass upon the lower track.

It is a further purpose of the invention to provide the upper track with a sliding section, that can be quickly and conveniently operated from a switch tower to bridge said opening in the upper track when said track is to be used, the same mechanism being employed for carrying the bridge section of the upper track to open or to closed position, and by said construction to provide complete and continuous tracks available for both roads.

It is also a purpose of the invention to provide means for displaying proper signals indicating a clear track or a block as the case may be. When one line has the crossing the signals on the other line will show a block, and no clear track can be had until the crossing is in normal condition.

Another purpose of the invention is to provide for a continuous alarm during the entire time that the bridge section of the upper track remains open, and further to provide means for heating the sliding section of the track and its guides to prevent said section from becoming frozen up in cold weather, the means for supplying the heat being controllable at the switch stand or tower.

The invention consists in the novel construction and combination of the several parts as will be hereinafter fully set forth and pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improved crossing showing the under track free for traffic and the upper track blocked, the cover for the sliding track section and connected operating parts being removed; Fig. 2 is a sectional plan view of the crossing, illustrating the upper track free for traffic and the lower track blocked; Fig. 3 is a vertical section taken practically on the line 3—3 of Fig. 2; Fig. 4 is a section taken at right angles to the section shown in Fig. 3 and practically on the line 4—4 of Fig. 2; Fig. 5 is a detail section through the valve employed for controlling the compressed air usually employed for operating the sliding section of the crossing; and Fig. 6 is a detail view of an electric contact for an alarm, to be automatically brought into action by the sliding track section when slid to blocking position relatively to the upper track.

A represents a track, the rails 10 whereof are practically continuous where they are closed by the rails 11 of a second track B, and these two tracks may be used by different roads or by one road and a branch thereof. The two tracks A and B cross one another at an angle, and the rails 10 of the track A are laid upon sleepers 12, that occupy the customary position on the roadbed, while the rails 11 of the crossing track B are elevated so as to freely clear the tread portions of the rails of the track A.

A gap or space is provided in the length of the rails 11 of the track B where the track B crosses the track A, and this space or gap is of sufficient dimensions to admit of the free passage of a train over the track A, and this gap or space in the length of the upper track B is closed when the track B is open for traffic, by means of a bridging section C provided for the aforesaid track B, and when this bridging section C closes the aforesaid gap over the track A the track A is blocked, and when the bridging section C is removed from the gap or carried from over the track A, the latter track is open for traffic, while the elevated track B is blocked.

Between the two rails 10 of the track A where the gap in the track B occurs, two beams 14 extend longitudinally of and adjacent the inner faces of the rails 10, being supported on the sleepers 12, as is best shown in Fig. 3, and at the central portions of the beams 14, a platform 15 is secured to the opposing faces of the beams 14, and this plat-

form may be further supported by a block 16 engaging with its under face, being secured to the sleepers 12 for the track A, as is shown in Fig. 4.

A plate is located at each end of the platform 15, being supported by the beams 14, as is shown in Figs. 1, 2, and 4, and these plates at their inner edges extend over the platform 15 and are free therefrom so that guides to be hereinafter described, may be passed along the inner under surfaces of said plates, which plates are designated respectively as 17 and 18. In the central portion of the upper face of the platform 15 and the beams 14, a transverse recess 19[a] is produced, as is best shown in Fig. 4, which recess occupies a position that is parallel with the rails 11 of the track B, and a position also corresponding to a central position between said rails 11, as is shown best in Fig. 1.

A wear plate 19 is laid upon the bottom of the recess 19[a], as is best shown in Fig. 3, the ends of the said wear plate are by preference bent down to the outer side edges of the beams 14, as is also shown in Fig. 3. Parallel guide plates 20 and 21 are located transversely on the upper face of the platform 15, and its accompanying beams 14, one of the said plates being at each side of the longitudinal center of the said recess 19[a], and the inner edges of these plates 20 and 21 extend over the recess 19[a], as is shown in Fig. 4, to provide a slideway for the portion of the bridging section C for the track B. The ends of the rails 11 at the space in the track B are beveled from the inside upward, as is shown particularly at 22 in Figs. 1 and 2, and parallel plates D are secured upon the sleepers 13 of the track B at that portion of the track that receives the bridging section C when the gap in the track B is open, as is shown in Fig. 1.

A space 23 is provided between opposing plates D, and the said space 23 is of corresponding width and is in alinement with the space between the guide plates 20 and 21, the plate D and plates 20 and 21 performing the same function, and to that end the plates D are elevated to a greater or lesser extent from the sleepers or ties 13 upon which they rest.

With reference to the bridging section C for the track B, this bridging section consists of two parallel rails *c* of such length as to fit between the opposing ends of the rails 11 of the track B at the gap therein over the track A, and the ends of the rails *c* of the bridging section are beveled from the outside inward, as is shown at 24 in Figs. 1 and 2, in order that the beveled ends 24 of the bridging rails *c* may closely fit to the beveled surfaces 22 of the main rails 11 of said track B.

A shield 25 angular in cross section, is secured to the inner face of each of the bridging rails *c*, as is best shown in Fig. 4. The vertical portions of these shields are secured to the rail sections *c* by bolts or their equivalents, and extend only the length of the web portions of said rail sections, whereas the horizontal members of the said shields extend beyond what may be termed the rear ends of the rails *c* of the bridging section C, as is shown at 26 in Fig. 1, and the rearwardly projecting end portion of one of the said shields has its inner edge 26[a] more or less curved for a purpose to be hereinafter described. It may be here remarked that the shields 25 commence at what may be termed the forward end portions of the said rails *c* for the bridging section C.

A guide plate 27 is located centrally between the rails *c* of the bridging section C, parallel with said rails, and this guide plate 27 is adapted for sliding movement beneath the plate D and the plates 20 and 21, in fact said plates constitute slideways for the guide plate 27 of said bridging section. The outer end portion of a piston rod 28 is attached to the guide plate 27 of the said bridging section C. This piston rod is located above the space between the plate D and plates 20 and 21, and is attached to the said guide plate 27 by means of lugs 29 shown in Figs. 3 and 4, which lugs extend above the upper face of the piston rod, as is particularly shown in Figs. 1, 2 and 4, and from each of the said lugs 29, opposing pairs of ears 29[a] are transversely projected. One set or pair of ears have pivoted between them levers 30 and these levers extend in a forward direction, or in direction of the opening or gap in the track B, and are pivotally attached at their outer ends to the flanges of the rails *c*, and corresponding levers 31 are made to extend in the same direction and at practically the same angle as the levers 30, and are also pivotally attached to the flanges of the rails *c*, said pivotal connection between them being designated as 30[a] and shown particularly in Figs. 2 and 3. The levers 30 and 31 constitute toggles, and when the piston rod 28 is drawn rearwardly or away from the gap in the track B, the rails *c* are drawn together in parallelism until they engage with the inner face of the webs of the rails 11, as is shown in Fig. 1, whereupon by a continuous rearward movement of the piston rod 28 to be operated in the manner to be hereinafter described, the said bridging section C will be over the plates D, as is shown in Fig. 1, and the gap in the track B will be fully open and the track B will be blocked and the track A will be open for traffic; on the other hand if the piston rod 28 is forced forward or in direction of the aforesaid gap in the track B the bridging section C will be carried in direction of the gap and in so traveling its guide bar 27 will enter beneath the guide plates 20 and 21 constituting the slideways on the platform 15 and will travel in the said slideways until the

ends of the rail sections *c* are practically opposite corresponding ends of the main rails 11, whereupon since the rail sections *c* are now free to move outward or inward, further rearward movement of the piston rod 28 will cause the said rail sections *c* to move in parallelism laterally outward, bringing the inclined or beveled surfaces of the main rails in firm and smooth engagement with the beveled faces 24 of the rail sections *c*, as is shown in Fig. 2, and at said time the track A will be blocked at the crossing of the track B, while the track B at such point will be open.

In the further construction of the bridging section C, guide bars 32 are loosely mounted on the piston rod 28, as is shown in Fig. 4, and these guide bars extend beneath the shields 25, the said guide bars 32 being provided with suitable downwardly extending sections 32^a to receive the said piston rod, as is also shown in Fig. 4. These guide bars occupy a position adjacent the inner or opposing faces of the ears 29^a of the toggles 30 and 31, as is shown in Fig. 2, and serve to carry an arched cover plate 33 attached to the said guide bars by means of screws 32^a, or their equivalents, as is shown in Fig. 3. This cover plate serves to protect the mechanism below it from the inclemency of the weather, and consequently moves with the bridging section C freely between the rails 11. The ends of the rail sections *c* of the bridging section C that cross the gap in the track B have the inner faces of their inner flanges beveled inwardly, as is shown in dotted lines at 33^b in Fig. 2, and these beveled ends of the said flanges of the rails *c* as the bridging section is about to close the said gap, enter into an engagement with angular directing plates 22^a, shown in Figs. 1 and 2, but best in Fig. 1, and as the inclination of these directing plates is from the gap toward the beveled ends of the rails 11, as the bridging section closes over the gap the rails will be directed by the said plates 22^a to a closing position relatively to the beveled end portions of the rails 11. Thus the directing plates 22^a assist the toggle levers 30 and 31 in their placing action. The bridging section C of the track B is also guided in its movement by securing curved guide arms 34, to the inner edges of the inner flanges of its rail sections *c*, as is shown in Figs. 2 and 4, and these curved guide arms 34 engage with the inner or opposing edges of the slideway or platform plates D and 20 and 21. When the rail sections *c* of the bridging section C are moved outward to closing position on the platform 15, their upper flanges engage with angular or curved stops 35 secured to the plates 17 and 18, which stops serve to limit the outward movement of the rail sections *c* should they sustain any severe inner strain in a lateral direction, and the upper end of an angular lever 37 extends upward through the plate 18 and, as is shown in Fig. 4, is engaged by an outer flange of the rail section *c* at that side of the bridging section C which is opposite the said lever in bridging position. This lever 37 is provided with a spring 38 that bears against its flange or horizontal section, as is also shown in Fig. 4, and serves to hold the vertical section of the lever, or that which is in engagement with the rails *c*, in position to be engaged. The outer end of the horizontal member of the latch lever 37 is passed between brackets or keepers 39, as is shown in Figs. 1 and 4, and a bar 40 has sliding movement in the said keepers or brackets, being provided at its lower edge with a recess 41 normally engaged by the lower or horizontal portion of the latch lever 37 when the head of the said latch lever is not in engagement with a rail of the bridging section C, but as long as such a rail is in engagement with the head of the lever 37 the said lever is carried out from locking engagement with the sliding bar 40. This sliding bar 40 has one of its ends connected with the link 42 with a hand lever 43 or the like pivotally mounted in a suitable rack 44, being also provided with the customary thumb latch, and the opposite end of the sliding bar 40 is pivotally connected with a link 45 that extends in an opposite direction or in the direction of the movement of the bridging section C in closing the gap in the track B and this link 45 is pivotally connected with, for example, a bell crank lever 46, as is shown in Fig. 1, and the said bell crank lever 46 by means of a plain link 46^a is connected with a switch point 47 adapted to open or close the break in one of the rails 11, as is particularly shown in Fig. 1, so that should by any possibility the bridging section C be open and the signal denoting such fact be not observed by the engineer of a train approaching the said switch 47, it would be derailed by the said switch before reaching the track B, since the switch 47 will have, as a precaution, been set to the open, while the bridging section C is in corresponding position, and being so set it cannot be again closed until the bridging section again spans the gap in the track B, opening the same for traffic.

In connection with the two tracks, a signal is employed of any approved type. This signal may be located wherever it is deemed most advisable, and is adapted to be automatic in its action. In the drawings it is shown as located where the forward left-hand portion of the track B intersects the forward right-hand portion of the track A, as is shown in Figs. 1 and 2, and in the drawings this signal consists of a signal shaft 48 having semaphores 49 at its upper end and corresponding lights to show danger or safety. The shaft 48 is provided, usually adjacent its lower end, with a crank arm 50,

and this crank arm is pivotally connected with a horizontal link 51, and the said link 51 in its turn is pivoted to the outer end of an angle or elbow lever 52, which is pivoted upon a suitable support 52[a], upon which support the lower end of the signal shaft 48 is pivoted. A spring 53 having bearing against the lever 52, tends to force the foot 54 of said lever to a position to be engaged by a rail section *c* of the bridging section C when the said bridging section is in closing position relatively to the track B, and when such engagement is made, as is illustrated in Fig. 2, the signal will show safety to the track B and danger to the track A. When, however, the bridging section C of the track B is carried to the right-hand portion of the said track B or to the right-hand side of the track A, as is shown in Fig. 1, the signal will show safety to the track A and danger or block to the track B, being automatically carried to such a display condition by the action of its spring 53.

To the rear of the right-hand portion of the track B I have illustrated a signal tower C′, and I have also illustrated an alarm device C[2], as located upon the said tower, but this alarm device may be otherwise placed, and the alarm device is adapted to ring continuously while the bridging section C is in the open position shown in Fig. 1. The contact may be made in many ways, but usually it is provided for as illustrated in Figs. 1, 2 and 6, wherein a wire 55 from the battery to which the bell is connected, is connected with a contact post 56 located upon a suitable support 57, at the rear of the platform plates D and this contact post 56 is provided with a downwardly and an outwardly flaring member 58, which member 58 when the bridging section C is in the open position shown in Fig. 1, is engaged by the rear end portion of a segmental contact 59 provided with an upwardly extending post 60 at its inner end portion, to be engaged by an inclined rear projecting edge 26[a] of one of the shields 25. The segmental contact 59 is mounted upon a suitable pivot 62 that is carried by one of the sleepers 13, and a spring 62[a], coiled around the said pivot, acts upon the contact 59 in such manner as to normally force the said contact to an engagement with a limiting pin 63, so as to bring the post 60 always in the path of the said rear end portion 26[a] of the shield 25 of the bridging section C, when the latter is in open position. A wire 61 leads from the segmental contact plate 59 up to the battery connected with the alarm device, to complete a circuit when the two contacts 56 and 59 are brought into engagement.

I provide means for heating the under surface of the platform or guide plates D in cold weather; this I accomplish by locating a heater 64 in the switch tower C′, placing a coil of pipe, for example, in the said heater and carrying the ends of the coil 65 out from the switch tower down to a point below the said plates D, as is shown in dotted lines in Fig. 1, and producing beneath said plates D a second or heat transmitting coil 66. The supply of heat may be controlled in any suitable or approved manner.

With reference to the means for operating the bridging section C that is moved out to and from the gap in the track B; the power employed may be electric, steam, or pneumatic, but usually pneumatics are employed, and are connected in substantially the following manner: A cylinder E is located between the rails 11 at the right-hand side of the track A, and the piston rod 28 is passed into the said cylinder and is provided therein with a suitable head 67, as is shown in Fig. 2. An inlet 68 is provided at the inner end portion of the cylinder so as to introduce compressed air in front of the piston head 67, and a second inlet 69 is produced at the rear end of the cylinder E so as to introduce compressed air at the rear of the piston head. A pipe 70 is connected with the forward inlet 68 and a pipe 71 is connected with the rear inlet 69, and these two pipes are carried into the switch tower C′ and are connected with a valve E′. The preferred form of valve E′ is shown in detail in Fig. 5, wherein its casing is provided with an inlet port 74, an opposing exhaust port 76, a port 78 connected with the pipe 71 leading to the rear of the cylinder, and a corresponding and opposing port 79 connected with the pipe 70 leading to the front or inner end of the cylinder. The plug 72 of the valve E′ is operated by means of a handle 73 of any approved type, being adapted to turn as is customary, in the valve casing. This plug is provided with two angular opposing ports 80 and 81, and in operation each plug port is either in engagement with an outlet to the cylinder and the inlet 74, or an outlet to the cylinder and the exhaust port 76. The inlet port 74 of the valve is connected by a pipe 75 with any source of compressed air supply, while the exhaust port 76 is connected in any approved manner with any suitable exhaust pipe 77, led wherever desired. In the position of the ports shown in positive lines in Fig. 5, the plug port 80 connects with the inlet 74 and the front supply 70, therefore air is furnished to the front of the piston 67 to force said piston back and carry the bridging section C to the open position shown in Fig. 1, and when the piston 67 reaches the rear end portion of the cylinder the compressed air will enter the valve through the pipe 71 and port 78 and be conducted through the port 81 to the exhaust 77. When it is desired to move the bridging section C to closing position relatively to the track B, the position of the ports in the plug

is changed to that shown in dotted lines in Fig. 5, and air will be admitted to the rear of the piston and will leave the cylinder at the front and will be in its turn conducted to the exhaust. When the plug 72 is turned so that its ports 80 and 81 are out of registry with the ports in the casing of the valve, the supply of air is cut off to both ends of the cylinder.

The platform plates D are provided with a cover 82 located between the rails 11, being adapted to protect the bridging section C when shifted over said plates.

The rails 11 of the track B, where said rails approach the rails 10, of the track A, and where the beveled end surfaces 22 of the rails 11 occur, have their flanges widened and continued beyond the bevel of the web and head or ball of the said rails 11, as is shown in Figs. 1 and 2, and these extensions designated *x*, engage with the heads or balls of the rails 10, as is particularly shown in Fig. 3. This feature is a very important one in a crossing of the character shown, since it prevents expansion where the rails cross and insures a free and easy movement of the bridging section C. This crossing cannot be forced out of line by expansion or contraction, since expansion of the rails of the lower track A, will not have any detrimental effect upon the rails of the upper track B.

I desire it to be understood that I do not confine myself to these details of construction, many of which have been described in the interest of clearness only.

Having thus described my invention, I claim as new and desire to secure by Letters Patent,—

1. In a railway crossing, the combination with two tracks, one crossing the other at an elevation, the upper track having a gap therein where it crosses the lower track, of a sliding bridging section for the said gap, a plunger connected with the bridging section for operating the same, and means for actuating the said plunger.

2. In railway crossings, a lower and an upper track, the upper track having an opening therein exposing the full width of the lower track, and a bridging section mounted to slide between the rails of the upper track, a plunger connected with the bridging section for carrying said bridging section to and from the said opening, and devices for operating said plunger from a point beyond the tracks.

3. In railway crossings, a lower and an upper track, the upper track being provided with a break in its rails where the lower track crosses it, exposing the full width of the latter track, a bridging section carrying sections of rails and mounted to slide between the rails of the upper track, a plunger, and a toggle connecting the plunger and the rails of the bridging section for moving said bridging section to and from the said break in the rails, and means for locking the rails of the bridging section to the main rails of the upper track and unlocking them therefrom.

4. In railway crossings, a lower and an upper track, the upper track being provided with a break in its rails where the lower track crosses it, exposing the full width of the latter track, a bridging section carrying sections of rails and mounted to slide between the rails of the upper track, means for bodily moving the rails of the bridging section between the main rails of the upper track to and from the break in the main rails of the upper track and for moving the rails of the bridging section on parallel lines outward and inward opposite the said break to lock or unlock the rails of the bridging section relatively to the ends of the main rails at said break.

5. In a railway crossing, a lower and upper track, the upper track being provided with a break in its rails where the lower track crosses, exposing the full width of the lower track, a bridging section carrying rails mounted to slide between the rails of the upper track, means for bodily moving the rails of the bridging section to and from the said break in the rails of the upper track, means for carrying the said rails of the bridging section bodily and on parallel lines outward or inward, to or from the end portions of the main rails of the upper track at the break therein, and guides independent of said means for bringing the ends of the main rails of the upper track and the abutting ends of the rails of the bridging section into firm engagement making a continuation of the rails of the upper track where the said break formerly was.

6. In railway crossings, the combination with a lower track, and an upper track having a break therein over the lower track exposing the full width of the latter, of a bridging section comprising opposing rails adapted to fully cover the break in the main rails of the upper track, the rails of the bridging section being adapted for movement to and from the break in the rails of the upper track, a signal device readable from both tracks, means for setting the said signal at block for either track according to the position of the bridging section, an alarm device, and means for continuously operating the said alarm device while the bridging section is removed from the break in the said upper track.

7. In a railway crossing, a lower track, an upper track having a gap therein where it crosses the lower track, a bridging section for the said gap mounted to slide between the rails of the upper track, an electric alarm and circuit connections therefrom, and means for making and breaking the said circuit by the movement of the bridging section to and from the said gap in the said upper track,

the said means including a fixed contact, and a movable contact for engagement with the fixed contact and having a member held in the path of the bridging section, and means for moving said bridging section to and from the said gap.

8. In railway crossings, the combination with a lower track and an upper track having a gap therein exposing the full width of the lower track, a signal device located at a point from which it can be read from both tracks, the said signal device being spring controlled in one direction, of a bridging section provided with rails adapted to fill the spaces in the gaps between the rails of the upper track, the rails of the bridging section being adapted for sliding movement between the main rails of the upper track to and from the said gap, means for operating the said bridging section to and from the gap and for carrying the rails of the bridging section to and from engagement with the ends of the main rails at said gap, and a projection from the operative mechanism of the said signal, which projection is in the path of the bridging section when crossing the said gap, whereby the said signal is set for danger relatively to the upper track when the gap therein is uncovered by the said bridging section and is set for danger relatively to the lower track when the said gap is closed in the upper track by the said bridging section.

9. In a railway crossing, the combination with a lower track, an upper track raised independent of the lower track, and provided with a gap therein exposing the full width of the lower track, of a bridging section comprising rails adapted to fill the gap in the rails of the upper track, a plunger and a toggle connecting the plunger and the rails of the bridging section, guides for the said plunger located between the rails of the lower track and corresponding guides for the plunger located between the rails of the upper track, and means for pneumatically operating the said plunger to carry the bridging section to and from the gap in the rails of the upper track and to carry the rails of the bridging section into or out of engagement with the rails of the said upper track.

10. In a railway crossing, the combination with a lower track, a second track crossing the same at an elevation, the lower track being provided between its rails with a transverse slideway located about centrally between the rails of the upper track and parallel therewith, a corresponding slideway located between the rails of the upper track, being in longitudinal alinement with the slideway between the rails of the lower track, the upper track being provided with a gap in its rails exposing the full width of the lower track, of a plunger mounted to slide in the said guideways, means for imparting end movement to the said flange sections of the rails adapted to fill the space between the opposing ends of the rails of the upper track at the gap therein, and toggle connections between the plunger and the said sections of rails, the said sections of rails being mounted for sliding movement between the rails of the upper track and for bodily movement to and from each other.

11. In a railway crossing, the combination with a lower track, a second track crossing the same at an elevation, the lower track being provided between its rails with a transverse slideway located about centrally between the rails of the upper track and parallel therewith, a corresponding slideway located between the rails of the upper track, and in longitudinal alinement with the slideway between the rails of the lower track, the upper track being provided with a gap in its rails exposing the full width of the lower track, of a plunger mounted to slide in the said guideways, means for imparting end movement to the said flange sections of the rails adapted to fill the space between the opposing ends of the rails of the upper track at the gap therein, toggle connections between the plunger and the said sections of rails, the said sections of rails being mounted for sliding movement between the rails of the upper track and for bodily movement to and from each other, a signal device, and means for automatically setting the said signal device to display signals of different characters according to the movement of the said rail sections to or from the gap in the upper track.

12. In a railway crossing, the combination with two tracks, one crossing the other at an elevation, the upper track having a break in its rails where it crosses the lower track, a bridging section carrying sections of rails and mounted to slide between the rails of the upper track, means for bodily moving the rails of the bridging section between the main rails of the upper track to and from the break in said rails and for moving the rails of the bridging section on parallel lines outward and inward opposite the said break to lock or unlock the rails of the bridging section relatively to the ends of the main rails at said break, and means for sounding an alarm when the said bridging section is moved from the break in the rails.

13. In a railway crossing, the combination with two tracks, one crossing the other, the upper track having a gap therein where it crosses the lower track exposing the full width of the lower track, of a sliding bridging section for the said gap, means for operating the said bridging section to and from the said gap, and means for heating the bridging section when carried away from the said gap.

14. In a railway crossing, the combination with two tracks, one crossing the other at an elevation, the upper track having a gap there-

in where it crosses the lower track, of a sliding bridging section for the said gap, means for moving the said bridging section to a closed position relatively to the gap, or to a position to open the said gap, a signal device readable from both tracks, and means for setting the said signal at block for either track according to the position of the said bridging section.

15. In railway crossings, the combination with two tracks, one crossing the other at an elevation, the upper track having a gap therein where it crosses the lower track exposing the full width of the latter, of a sliding bridging section for the said gap, means for operating the said bridging section to and from said gap, a signal device, spring-controlled in one direction and controlled in the other direction by the movement of the bridging section unclosing the gap, a switch located in a rail of the upper track adjacent the gap therein, a lever operating said switch, and means for locking the said lever when the bridging section uncovers the gap and for unlocking the said lever when the bridging section is in closing position relatively to the said gap.

16. In railway crossings, a lower and an upper track, the upper track having an opening therein exposing the full width of the lower track, and a bridging section carrying sections of rails and mounted to slide between the rails of the upper track, means for moving said bridging section between the rails of the upper track to and from the said opening and for moving the rails of the bridging section on parallel lines outward and inward opposite the said break, and devices for operating said means from a point beyond the tracks.

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

GEORGE PETER KEITH.

Witnesses:
WILLIAM K. STEVENSON,
ORBRA F. MONTGOMERY.