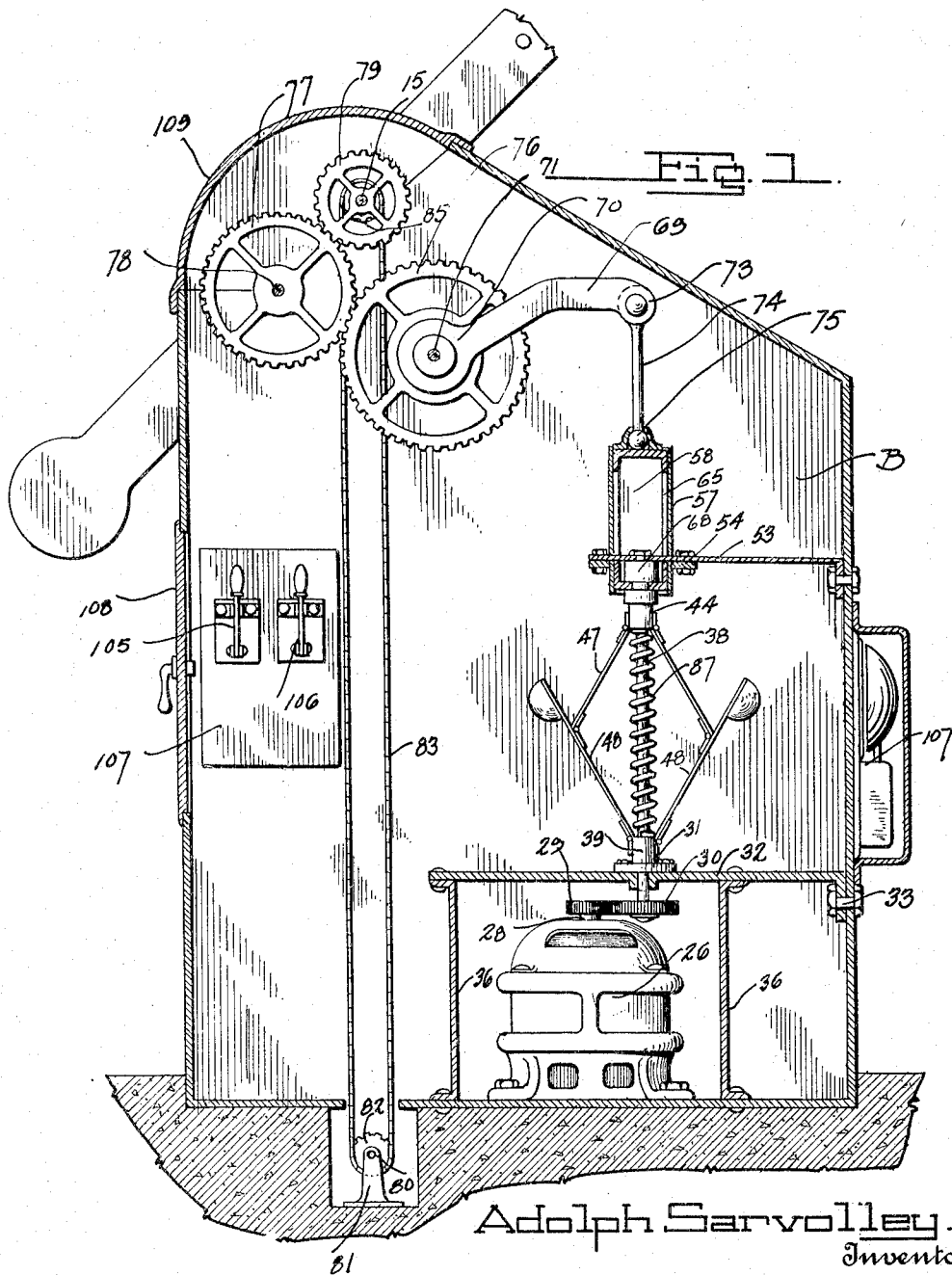


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 AUTOMATIC SAFETY GATE FOR RAILROAD CROSSINGS.
 APPLICATION FILED NOV 28, 1919.

1,361,408.

Patented Dec. 7, 1920.

4 SHEETS—SHEET 1.



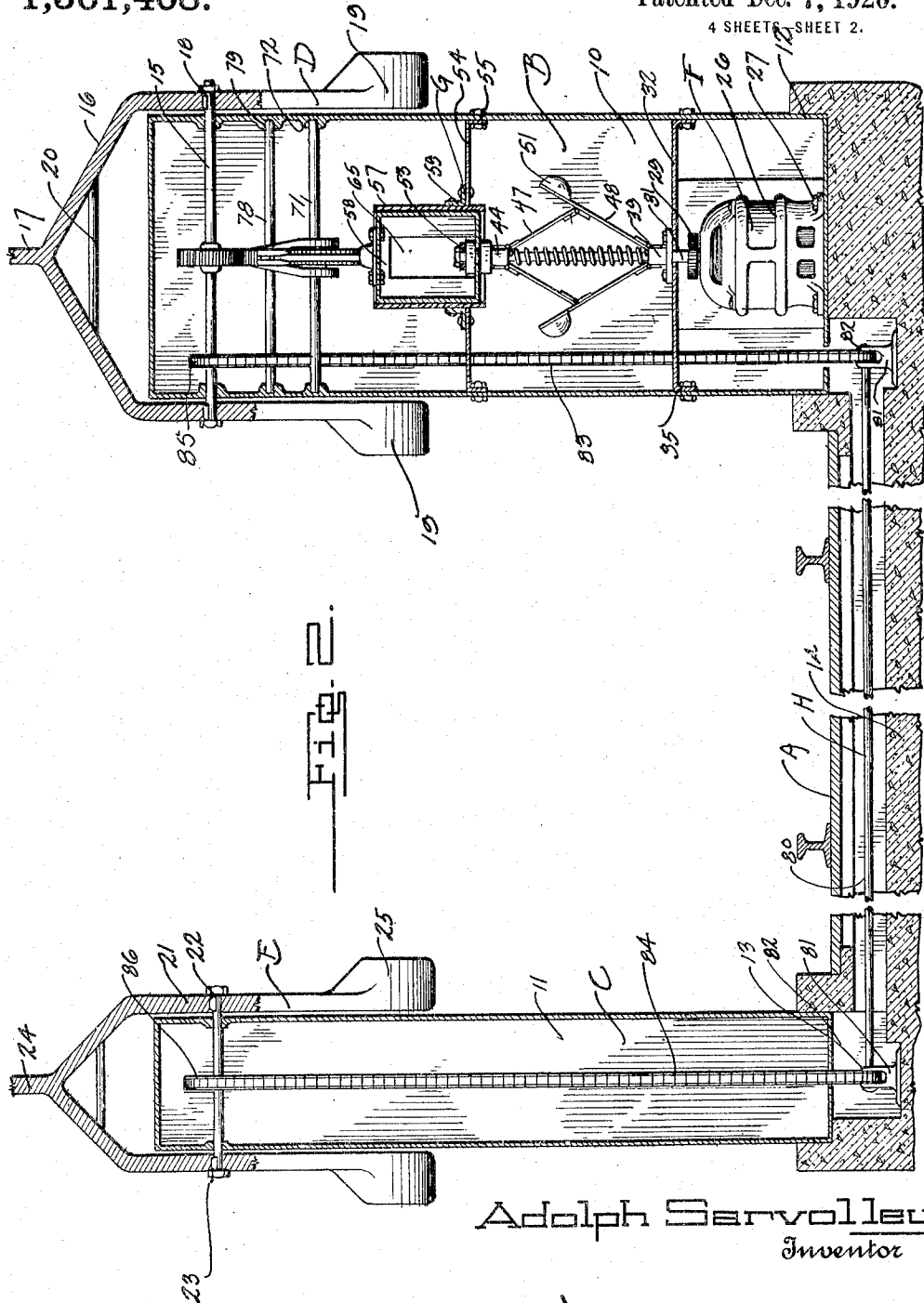
By *Lancaster and Allwine*
 Attorneys

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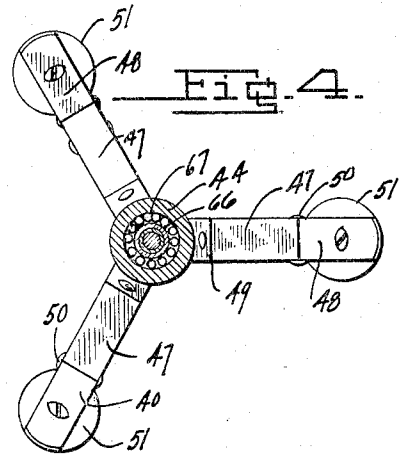
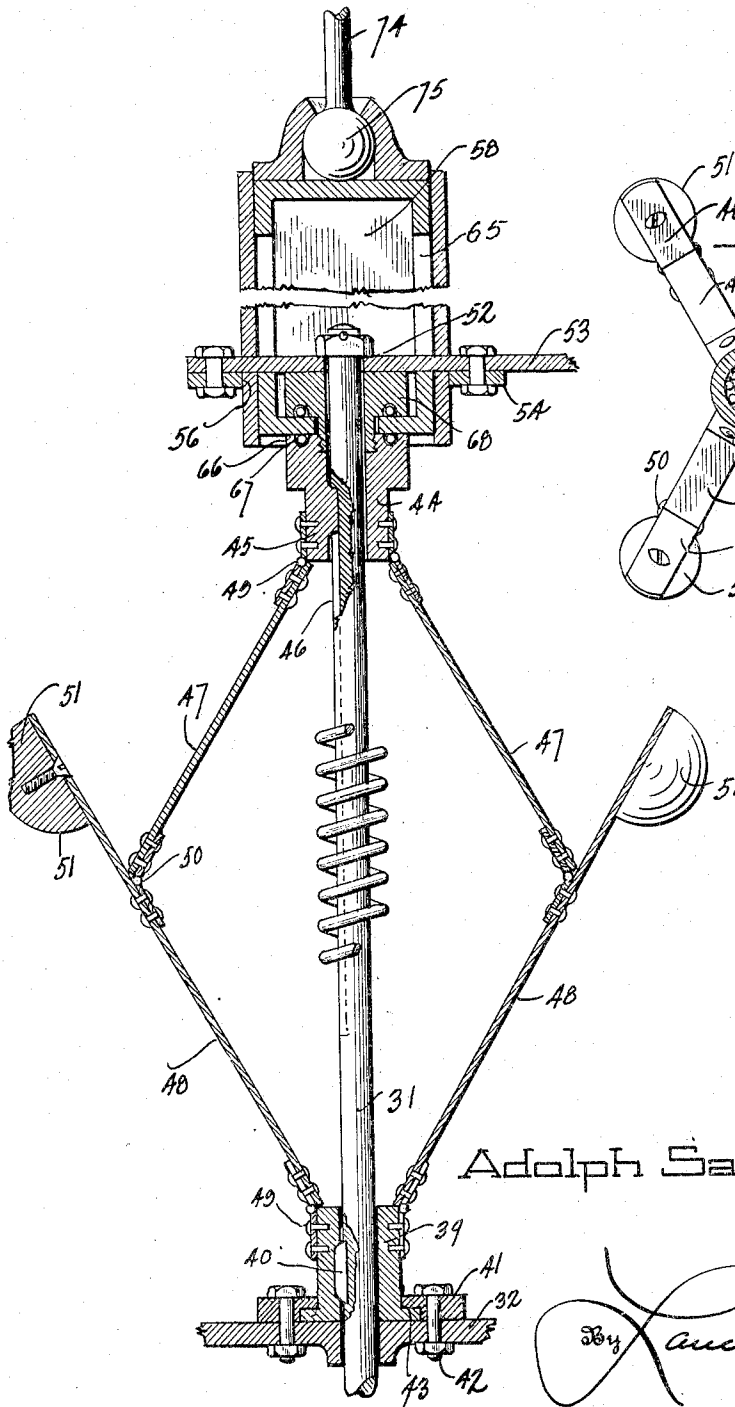
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4 SHEETS—SHEET 3.

Fig. 3.



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Inventor

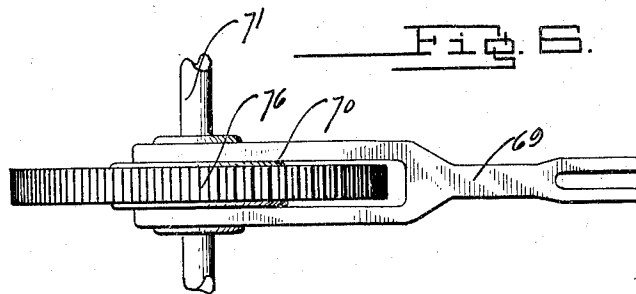
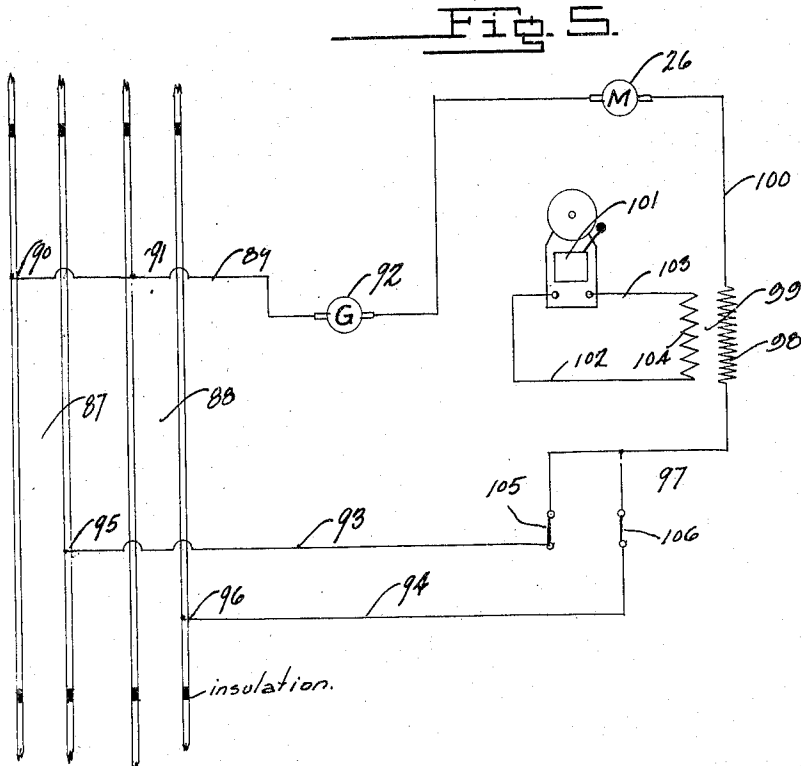
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

ADOLPH SARVOLLEY, OF BRAZIL, INDIANA.

AUTOMATIC SAFETY-GATE FOR RAILROAD-CROSSINGS.

1,361,408.

Specification of Letters Patent.

Patented Dec. 7, 1920.

Application filed November 28, 1919. Serial No. 341,120.

To all whom it may concern:

Be it known that I, ADOLPH SARVOLLEY, a citizen of the United States, residing at Brazil, in the county of Clay and State of Indiana, have invented certain new and useful Improvements in Automatic Safety-Gates for Railroad-Crossings, of which the following is a specification.

This invention relates to railroad crossing gates, and the primary object of the invention is to provide an improved means for automatically operating the gates upon the approach of a train from either direction, thereby obviating the necessity of employing a gateman or signal man at the crossing.

A further object of the invention is the provision of an improved means for operating the gate and for holding the gate in a lowered position until the train has passed the crossing and for automatically returning the gate to its normal position.

A further object of the invention is the provision of an electric motor interposed in a circuit which is adapted to be closed by a train having an improved connection with the gate of a railroad crossing so as to automatically lower the same upon the approaching of a train to the crossing.

A still further object of the invention is the provision of an improved rotary and sliding connection between the motor and the railroad gate, so as to permit the continuous operation of the motor while the train is approaching and going by the crossing, so as to allow the lowering of the gate and the holding of the gate in a predetermined position, without strain on the motor or the breaking of any of the connecting parts.

A still further object of the invention is to provide an improved means for electrically operating railroad crossing gates and for sounding an audible signal during the approach of the train and having means for rendering the signal and gate inoperative, so as to prevent the operation thereof, if a train is held on the crossing over a predetermined time.

A still further object of the invention is to provide an improved automatic electrically operated railroad crossing gate of the above character which is durable and efficient in use, one that is simple and easy to manufacture, and one which can be placed upon the market at a reasonable cost.

Other objects of the invention will appear in the following detailed description taken

in connection with the accompanying drawings, in which drawings:

Figure 1 is a longitudinal vertical section through one of the gate housings, showing the operating means for the gate.

Fig. 2 is a vertical transverse section across a railroad track bed at the intersection of a road crossing and showing the pair of gate houses or boxes positioned on the opposite sides thereof.

Fig. 3 is an enlarged detail vertical section through the means for connecting the motor with the railroad gate.

Fig. 4 is a detail horizontal section through the connecting means of the motor and gate.

Fig. 5 is a diagrammatic view of the electric wiring connection for the gate, and

Fig. 6 is an enlarged fragmentary detail elevation of a portion of the connecting means for the motor and gate.

Referring to the drawings, in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter A indicates a railroad bed having the railroad gate boxes B and C positioned on the opposite sides thereof and adjacent to the roadway, and the same rotatably supports the gates D and E. The gate box B has mounted therein a suitable type of prime mover F having operatively connected therewith the improved governor and sliding connection G for engaging and operating the gate D. A connection H is provided for operatively connecting the gates D and E together for synchronous movement. The gate boxes B and C each include the vertically disposed casings 10 and 11 formed of metal plates or the like, and have their lower ends embedded as at 12 and 13 in the road bed, which if so desired, may be constructed of concrete at such points, and the lower ends of the casings 10 and 11 are connected by a concrete box or casing 14, which extends under the tracks of the road bed.

The casing B is formed relatively larger than the casing C so as to accommodate the prime mover F and the operating means G, and the upper end of the same has rotatably mounted therein a transversely extending horizontally disposed shaft 15, the terminals of which extend beyond the side walls of the box.

The gate D includes an inner yoke shaped body 16, which is adapted to embrace the

upper end of the casing and a relatively long bar 17, which is adapted to extend across the roadway. The terminals of the shaft 15 are extended into arms of the yoke 16 and are keyed and secured thereto, as at 18. The inner terminals of the arms of the yoke 16 are provided with counter-balancing weights 19, so as to overcome the additional weight of the relatively long bar 17, the arms of the yoke 16 are further braced adjacent their inner ends by a cross bar 20.

The gate E is constructed similar to the gate D, and includes the V-shaped yoke 21 having the arms thereof embracing the upper terminal of the gate box C and keyed or otherwise secured as at 22 to the transversely extending shaft 23 journaled in the upper end of the box C. The arms of the yoke are connected at their inner ends and extended to provide the relatively long bar or barrier 24, and the opposite ends of the arms are provided with weights 25 so as to effectively counter-balance the bar.

The prime mover F consists of an electric motor or the like 26, which is bolted or otherwise secured as at 27 to the lower wall of the casing B and has the armature shaft 28 thereof provided with a gear wheel 29, which is adapted to mesh with the relatively large gear wheel 30 keyed to the vertically extending shaft 31 of the connecting mechanism G which will be hereinafter more fully described. The shaft 31 has its lower end journaled in a transverse cross brace 32 which is secured at its inner end by bolts or the like 33 to the outer end wall of the casing. As clearly shown in Fig. 2 of the drawings, the brace 32 extends transversely across the box B and is provided with right angularly extending flanges 35 which are bolted or otherwise secured to the side walls of the box. The brace 32 is provided with vertical supports 36 positioned on each side of the motor.

The connecting mechanism G of the gate and motor includes a governor 38 mounted on the shaft 31. The governor 38 includes the sleeve 39 keyed or otherwise secured to the shaft 31, as at 40 and held in place by a suitable flange collar 41 which is bolted as at 42 to the upper surface of the brace 32. The lower end of the sleeve 39 is provided with an outwardly extending annular flange 43 which is adapted to be engaged by the collar 41. An upper sleeve 44 is mounted on the shaft 31 for movement therewith and is provided with an inwardly extending key 45 which is slidably mounted in a keyway 46. This connection of the sleeve 44 with the shaft permits the sleeve to slide up and down on the shaft, as well as with the same. The sleeves 39 and 44 are connected by arms 47 and 48, which are hingedly connected as at 49 to the sleeves, and the inner terminals of the arms are connected by suitable hinges

50. The arms 48 are continued beyond and above the arms 47 and are provided with suitable weights 51. Thus it will be seen that when the shaft is rotated the weighted arms will be thrown outwardly by centrifugal force and thus slide the sleeve 44 on the shaft 31. The upper end of the shaft is rotatably mounted in a suitable aperture 52 formed in the inwardly extending brace 53 which is carried by one end wall of the box, and the same rests upon the relatively wide brace 54 which extends transversely across the box in close parallel relation to the brace 32 and has its terminals bent to provide flanges, which are bolted or otherwise secured to the side walls of the box. The transverse brace 54 is provided with a relatively large opening 56 which receives the guide sleeve 57 for the slide box 58.

The guide sleeve 57 is held against movement by suitable angle braces 59 which are bolted to the upper surface of the brace 54 and the guide sleeve. The slide 58 is of hollow formation and the side walls thereof are provided with the vertically extending guide grooves 65, through which the brace 53 extends. The upper end of the sleeve 44 of the governor 38 is enlarged at its upper end and provided with a race 66 for the ball bearings 67 which are adapted to engage the lower surface of the lower wall of the slide box 58. The upper end of the enlargement of the sleeve 44 detachably carries the ball bearing cup 68 for engaging the upper surface of the lower wall of the slide 58, and it will be seen that when the governor arms are thrown outwardly by centrifugal force, the slide 58 will be carried downwardly therewith. A crank arm 69 having a slotted inner end 70 is keyed or otherwise secured to the transversely extending shaft 71 which extends below in spaced parallel relation to the shaft 15 and the terminals of the shaft are journaled in suitable bearings 72 carried by the side walls of the box B. The inner end of the crank arm 69 is hingedly connected by means of a pivot pin 73, to a connecting link 74, which is connected to the upper wall of the slide 58. Interposed between the slotted arms of the crank 69 is a relatively large gear wheel 76 which is also keyed to the shaft 71, and which gear meshes with a slightly smaller gear 77, which is also keyed or otherwise secured to the transversely extending shaft 78, which has its terminals journaled in suitable bearings 79 formed on the side walls of the box B. This shaft 78 extends intermediate the shafts 71 and 15 and in spaced parallel relation thereto and the gear wheel 77 meshes with a relatively small gear wheel 79 keyed to the shaft 15. Thus it will be seen that upon operation of the governor, the shaft 15 will be rotated, in a clock wise direction, thereby swinging the gate B downward across the

roadway. After the gate reaches a horizontal position, the movement thereof is limited by a suitable stop, (not shown) and breakage of the parts by the continuing rotation of the motor 26 is prevented by means of the connection of the shaft 31 with the slide 58. The means H for connecting the gates B and E together for synchronous movement includes a shaft 80, which extends transversely across the railroad bed and is journaled in suitable bearings 81 mounted in the concrete box 14. The terminals of the shaft 80 have keyed or otherwise secured thereto sprocket wheels 82, around which are trained the sprocket chains 83 and 84. The upper end of the sprocket chain 85 is trained around a relatively small sprocket wheel 83 keyed or otherwise secured to the shaft 15 which carries the gate D. The sprocket chain 84 has its upper end trained around a relatively small sprocket chain 86 which is keyed or otherwise secured to the shaft 22, which carries the gate. Thus it will be seen that through the medium of shaft 80 and the sprocket chains 83 and 84 the gates will be operated together upon operation of the motor F.

An expansion coil spring 87 is wound around the shaft 31 and is confined between the sleeves 39 and 44, and forms means for returning the slide 58 to its normal position after the train has passed by the crossing and out of the bounded area of the railway. The returning movement of the slide 58 will move the shaft 15 in a counter clockwise direction through the medium of the crank 69 and the gears 77 and 79, thereby restoring the gate to its normal position.

One or more tracks can be mounted on the road bed and as shown in the diagrammatic view of the circuit for the motor F, a pair of tracks 87 and 88 is disclosed and these tracks have insulation joints forming rail sections extending for a suitable distance beyond each side of the road crossing.

When the improved gate is used for railroad crossing embodying two tracks as shown in Fig. 5, a main lead wire 89 is electrically connected to one rail of each track 87 and 88 as at 90 and 91 and has the inner end secured to one terminal of the motor 26. The wire 89 has preferably interposed therein a source of electrical energy, such as an alternating current generator 92. Wires 93 and 94 have their outer ends electrically connected as at 95 and 96 to the other rails of the tracks 87 and 88, and the wires 93 and 94 have their inner ends connected together as at 97 and connected to the primary coil 98 of a transformer 99 and a wire 100 connects the other terminal of the primary coil of the transformer to the motor 26. An electric alarm bell 101 is interposed in a circuit embodying a pair of wires 102 and 103, which have their outer ends connected to the terminals

of a secondary coil 104 of the transformer 99. Thus it will be seen that when a train rides on the bonded portion of either one of the tracks 87 or 88, a circuit will be closed and thus operate the motor 26 and through the medium of a suitable transformer 99 ring the bell 101.

Switches 105 and 106 are interposed in the wires 93 and 94 and provide means for opening the circuit of either one of the tracks 87 and 88 in case a train stops on or adjacent to the crossing for a considerable length of time. The operation of the motor 26 by the closing of either one of the circuits of the tracks 87 and 88 will move the gates D and E to a closed position as above described.

The switches 105 and 106 are preferably mounted upon a suitable plate 107 mounted in the box B, and a suitable door 108 is formed in the box so as to permit ready access to the switches. If desired, however, the same may be secured on the outside of the casing or in spaced relation thereto. The upper end of the casing B is provided with a detachable section 109 which permits ready access to the interior of the box B adjacent to the shafts 71, 78 and 15, so as to permit the repairs to be readily made thereto when desired or necessary.

Suitable means may be provided for lubricating the shafts or other movable parts of the device, such as oil or grease cups or the like.

From the foregoing description it can be seen that an improved automatic gate is provided for railroad crossings which is of exceptionally simple and durable construction, and which will effectively accomplish the purpose intended and also eliminate the necessity of the employment of a gateman or signalman.

Changes in details may be made without departing from the spirit or scope of my invention; but,

I claim:

1. In a railroad crossing gate, the combination of a motor including an armature shaft, a pivoted gate, a crank arm, means operatively connecting the crank arm with the gate, a slide operatively connected with the crank arm, means operatively connecting the slide with the motor, an insulated track section, a circuit including said motor, said section and a source of electric energy and closed when a train is positioned on the insulated track section, for actuating the motor.

2. In a railroad crossing gate, the combination of an electric motor including an armature shaft, a pivoted gate, a slide operatively connected with the gate, means operated by the motor for lowering said slide, means operatively connecting the last mentioned means with the motor, an insulated

track section, a circuit including said motor, said section and a source of electrical energy and closed when a train is present on the insulated track section for actuating the motor.

3. In a railroad crossing gate, the combination of an electric motor including an armature shaft, a pivoted gate, a slide operatively connected to the gate, means operatively connecting the slide with the motor for lowering the slide, an insulated track section, a circuit including said motor, said section and a source of electrical energy and closed when a train is present on the insulated section for actuating the motor, and means for raising the slide to its normal position after operation of the motor ceases.

4. In a railroad crossing gate, the combination of a motor including an armature shaft and a pivoted gate and a slide operatively connected to the gate, means for lowering the slide, means for operatively connecting the motor with the slide operating means, an insulated track section, a circuit including said motor, said section and a source of electrical energy, and closed when a train is present on the insulated section for actuating the motor, and spring means for normally returning the slide to its raised position when the circuits are opened.

5. In a railroad crossing gate, the combination of an electric motor having an armature shaft, a pivoted gate, a shaft extending parallel with the armature shaft, means operatively connecting the shafts together, a slide, means operatively connecting the slide with the gate, and a governor mounted on the last mentioned shaft for rotation therewith, means operatively and rotatably connecting the movable portion of the governor with the slide for lowering the same, means normally holding the movable portion of the governor and the slide in a raised position, an insulated track section, a circuit including said motor, said section and a source of electrical energy, and closed when a train is present on the insulated section for actuating the motor.

6. In a railroad crossing gate, of the character specified, the combination of a motor having an armature shaft, a pivoted gate, a slide block, means for operatively connecting the slide block with the gate, a shaft extending parallel with the armature shaft, means operatively connecting the shafts together, a governor mounted on said shaft for movement therewith and including a movable portion slidably mounted on the shaft, means rotatably connecting the movable portion of the governor with the slide block, an expansion spring wound around said shaft and arranged to engage the mov-

able portion of the governor to hold the same and the slide in a raised position, an insulated track section, and a circuit including said motor, said section and a source of electrical energy, and closed when a train is present on the insulated section for actuating the motor.

7. In a railroad crossing gate, the combination of a motor having an armature shaft, a gate shaft, a gate keyed to the shaft, a slide block, means operatively connecting the slide block with the gate shaft, means operatively connecting the slide block with the armature shaft, means permitting the continuous rotation of the armature shaft in relation to the slide block, when the same is in its lowered position, means for returning the slide block to its raised normal position when the motor is not in operation, an insulated track section, a circuit including said motor, said section and a source of electrical energy, and closed when a train is present on the insulated section for actuating the motor.

8. In a railroad crossing gate, a gate box positioned on each side of a railroad track, and adjacent to a railroad crossing, a gate pivotally carried by the upper end of each of the boxes, a shaft extending under the railroad road bed, and extending into the boxes, means carried by the shaft for operatively engaging the gates, means for operatively connecting a motor with one of the gates, an insulated track section, a circuit including said motor, said section and a source of electrical energy, and closed when a train is present on the insulated section for actuating the motor.

9. In a railroad crossing gate, a gate box, a gate shaft rotatably carried by the upper end of the box, a gate keyed to the shaft, a motor secured to the box, a guide carried by the box, a slide block mounted in said guide, a second shaft rotatably carried by the box, a crank arm keyed to the second mentioned shaft, a link operatively connecting the crank arm with the slide block, a train of gears connecting the second mentioned shaft with the gate shaft, the motor having an armature shaft, a driven shaft operatively connected with the armature, a governor carried by the driven shaft and including a movable portion slidably mounted on the driven shaft, means for rotatably connecting the slidable portion of the governor with the slide block, an insulated track section, a circuit including said motor, said section and a source of electrical energy, and closed when a train is present on the insulated section for actuating the motor.

ADOLPH SARVOLLEY.