Dec. 15, 1931. A. E. ALEXANDER 1,836,831

RAILROAD CROSSING GATE

Filed March 20, 1930 2 Sheets-Sheet 1

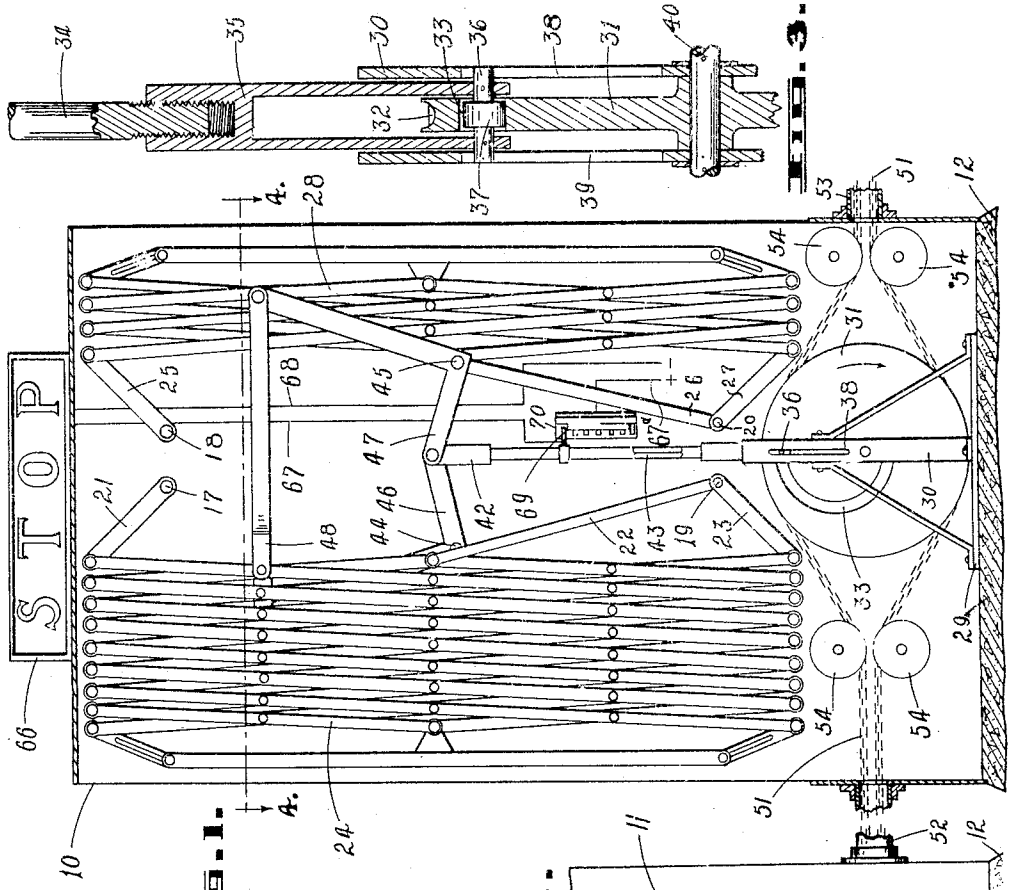


Fig. 1.

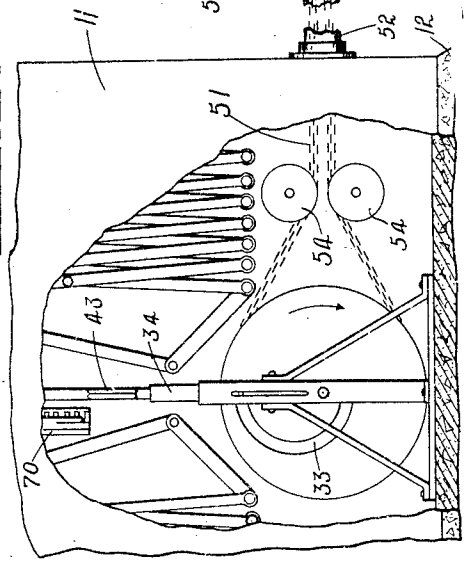


Fig. 2.

Fig. 3.

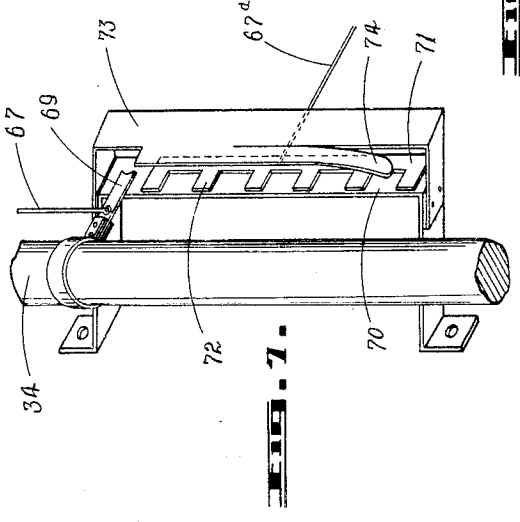


Fig. 4.

ARTHUR E. ALEXANDER.
INVENTOR.

BY Harold C. Shipman
ATTORNEYS.

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RAILROAD CROSSING GATE

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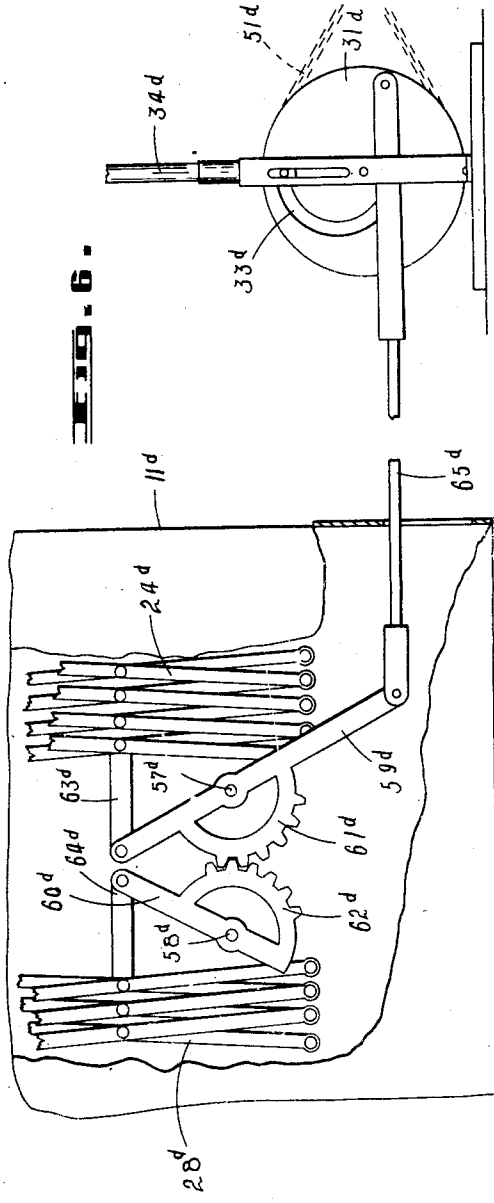


Fig. 6.

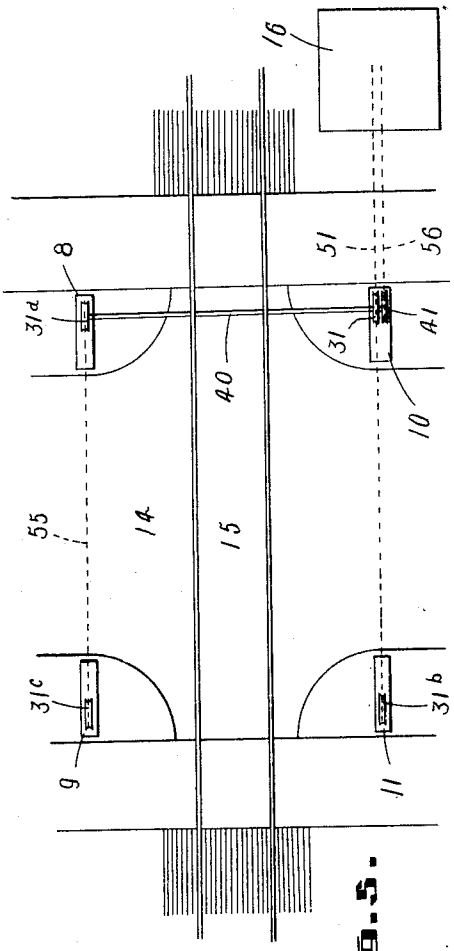


Fig. 5.

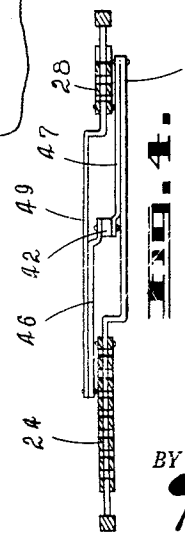


Fig. 4.

ARTHUR E. ALEXANDER,
INVENTOR.

BY Harold C. Shipman

ATTORNEYS.

Patented Dec. 15, 1931

1,836,831

UNITED STATES PATENT OFFICE

ARTHUR EARNEST ALEXANDER, OF OTTAWA, ONTARIO, CANADA

RAILROAD CROSSING GATE

Application filed March 20, 1930. Serial No. 437,542.

This invention relates to railroad-crossing gates and particularly in the method of operating the same.

The object of my invention is to provide a railroad-crossing gate in which each of the gate structures is of lazy-tong construction and which constructions are suitably housed in four enclosure housings and provided with means whereby the respective gates in each housing may be easily moved to extended position or returned to housed position by a watchman in the tower.

A further object is to provide, in combination with the hereinbefore mentioned object, a visible warning signal which will be intermittently flashed during the moving of the gate to extended position and the circuit for electrical supply being automatically broken during the return movement of the gate.

With the foregoing and other objects in view as will appear as the description proceeds, the invention consists of the novel construction, combination and arrangement of co-operating elements as hereinafter more specifically set forth, claimed and shown in the accompanying drawings forming a part of the present application, in which:

Fig. 1 is an elevation of one of the housings, the inner side of which is removed to disclose interior working parts.

Fig. 2 is a section view of the housing enclosing the working parts which co-operates with the working parts in the housing disclosed in Fig. 1, part of which housing is broken away to disclose interior working parts.

Fig. 3 is an enlarged sectional view of a portion of the preferred operating means.

Fig. 4 is a transverse view looking down upon and showing the operating links and their associate parts, taken on the line 4—4 of Fig. 1.

Fig. 5 is a schematic illustration of a railroad crossing showing the plan of the interconnecting setup of my invention.

Fig. 6 discloses a modified form of co-operative operation of the set of gates.

Fig. 7 is an enlarged perspective view of the signal control switch.

Like numerals of reference designate corresponding parts throughout the different views.

8, 9, 10 and 11 are gate housings mounted on cement bases 12 at the respective corners of the intersection of the roadway 14 and the railway 15. The opposite ends of the housings are open. 16 is the watchman's tower.

Fig. 1 discloses the gate structures in housed positions in the housing 10, the shaft operating wheel, hereinafter mentioned, not being shown in this illustration so as to more clearly show the details of the operating wheel for moving gates of this housing. Extending transversely in the housing 10, I provide transverse pins 17, 18, 19 and 20, the former two being as a spaced pair near the upper end of the housing 10 and the latter two being as a spaced pair near the lower end of the housing 10. 21, 22 and 23 are pivot links. The link 21 connects between the pin 17 and the upper inner corner of the road gate 24. The link 22 connects between the pin 19 and the inner central portion of the road gate 24. The link 23 connects between the pin 19 and the inner lower end of the road gate 24. In a like manner, the links 25, 26 and 27 connect between the pin 18, the pin 20 and the pedestrian gate 28. The road gate 24 and the pedestrian gate 28 are of a lazy-tong construction.

Mounted on the foundation base 12 is a suitable bracket 29, having upright supporting members 30 one on each side of the operating wheel 31. The periphery of the wheel 31 is provided with chain engagement webs 32. The wheel is provided with a cam slot 33. 34 is an operating rod, having an enlarged end 35 preferably threaded thereon. The end 35 is bifurcated to straddle the wheel 31. The pin 36 is carried at the extremity of the bifurcated end 35 and is provided with a roller bearing 37, which roller bearing is of a size and shape to conform to and operate in the cam slot 33. The upright supporting members 30 are provided with vertical slots 38 and 39. 40 is an operating shaft rotatably supported in the uprights 30 and on which the operating wheel 31 is freely mounted. This shaft 40 extends across under the railway tracks to operate a corresponding oper-

ating wheel 31^a in the housing 8, which operating wheel is fixedly mounted relative to the shaft 40. 41 is a pulley fixedly mounted on the opposite end of the shaft 40 and spaced outwardly from the operating wheel 31, the purpose of which will be hereinafter set forth. The operating rod 34 is provided at its upper end with an enlarged end 42, which is preferably in threaded connection thereon. The ends 35 and 42 are preferably oppositely threaded and the operating rod 34 may be squared as at 43, so that a wrench or other convenient turning tool can be readily applied to turn the operating rod 34 in either direction to adjust the distance between the enlarged ends 35 and 42. 44 and 45 are transverse pins supported in the housing 10 intermediate the pins 17—18 and 19—20. 46 and 47 are bell cranks, the heels of which are pivotally mounted on the pins 44 and 45 respectively. 48 and 49 are operating links connected at one end to the end of the leg portion of the bell cranks 46 and 47 respectively. These connecting links 48 and 49 have their opposite ends preferably offset and connect in alignment with the inner section of the gates 24 and 28 respectively. The ends of the foot portion of the bell cranks 46 and 47 are each pivotally connected to the upper end of the enlarged end 42, the ends of the foot portion being slotted to allow proper pivotal movement of the bell cranks 46 and 47 on their respective pins 44 and 45 when operated by vertical movement of the operating rod 34.

The housing 11 is provided with a similar construction as hereinbefore described, adapted to operate from the opposite side of the roadway 14, with the exception that the wheel 31^b is mounted on a transverse shaft 50 in the housing 11 instead of a shaft similar to the shaft 40 extending to the housing on the opposite side of the railway. 51 is a chain of suitable design to fit and co-act with the chain engagement webs 32 to operate the wheels 31 and 31^b. This chain 51 trains around the wheel 31^b with the upper portion thereof trained over the wheel 31, while the under portion is trained under the wheel 31. The upper and under portions of the chain 51 extend to and are connected with any desired operating means in the watchman's tower 16. It will be oppreciated that a suitable piping 52 or other boxing may be provided between the housings 10 and 11 in which the chain 51 may be housed. Similarly, a piping 53 or other boxing may be provided between the housing 10 and the tower 16. Suitably positioned and rotatably mounted in respect to the wheels 31 and 31^b, I provide idler pulleys 54 to facilitate proper movement of the chain 51 with respect to the operating wheels 31 and 31^b. I have not shown any particular structure for use in the tower by which the chain 51 may be operated, as such constructions are well known and any desired means for reversibly controlling the movement of the chain 51 may be used in respect thereto.

Referring to Figs. 1 and 2, the gates are shown in housed position. Upon operation of the chain 51 by the watchman, the upper portion of the chain 51 is pulled towards the tower while the bottom portion of the chain 51 is allowed to train outwardly under the wheel 31 and up around the wheel 31^b. As the wheels 31 and 31^b are turned in the direction of the arrows shown thereon, the operating rods 34 will be moved downwardly by means of the bearings 37 which are moved downwardly by the action of the cam slot 33 as the wheels 31 and 31^a are rotated.

In the housing 9, I provide an operating wheel 31^c similarly mounted to the wheel 31^b. Connected between the wheel 31^a and 31^c, I provide an endless chain 55 trained around the operating wheels 31^a and 31^c. Trained around the pulley 41, I provide an operating chain 56, which may be suitably housed in a piping or other boxing, which chain extends to the tower 16, and is provided with a means for operating the same similar to the means for operating the chain 51. When the operating means for this chain 56 is moved in the desired direction, the operating wheels 31^a and 31^c will be moved in the desired direction through the medium of the pulley 41, the shaft 40 and their interconnecting endless chain 55. When it is desired to return the gates to their respective housings, the respective chains will be moved in a reverse manner to that hereinbefore described, the respective bearings 37 being moved upwardly upon rotation of their co-operating cam slots 33, which will cause upward movement of the respective operating rods 34 and through their connecting mediums will provide the desired return movement of the respective gates to housed position.

Referring to Fig. 6, which shows a modified form of operating a pair of gates in each set, the operating wheel 31^d is similar to the operating wheel 31. In this modified form, the chain 51^d is trained only around the wheel 31^d. The operating rod 34^d and the cam slot 33^d are similar and have a similar operating action to that hereinbefore described. In the housing 11^d, I provide transverse pins 57^d and 58^d on which levers 59^d and 60^d are pivotally mounted. Carried inwardly of the levers 59^d and 60^d respectively are the segment racks 61^d and 62^d, which are in mesh relation to each other. 63^d and 64^d are operating links connected between the upper ends of the levers 59^d—68^d and the gates 24^d and 28^d respectively. 65^d is a connecting rod, one end of which is connected to the lower end of the lever 59^d, the opposite end of which is bifurcated and connected adjacent the periphery of the operating wheel 31^d below centre. Upon rotation of the wheel 31^d by the chain

51[d] in the direction of the arrow shown thereon, the respective gates will be moved to outward position and on reverse movement of the operating wheel 31[a], they will be returned to housed position.

On each of the housings 8, 9, 10 and 11, I provide an auxiliary housing 66, having opposite signal faces with any desired warning inscription, the visibility of which is increased upon energizing of electric lamps in the auxiliary housing 66.

The conductors 67 and 68 are suitably connected to the electric lamps supported in any conventional manner in the housing 66. The conductor 67 has its extended end connected to the contact finger 69 carried by but insulated from the operating rod 34. Suitably supported on the side of the housing or in any other desired manner, I provide a bracket 70 on which is mounted (but insulated from) the contact plate 71, having spaced projecting fingers 72 over which the contact finger 69 will move and contact with as the operating rod 34 is moved downwardly during the moving of the gates to extended position. Supported relative to the contact plate 71, I provide a bracket 73, the ends of which are attached to but insulated from the bracket 70. This bracket 73 supports a return plate 74 in a plane extending over the projecting fingers 72. The end of the return plate 74 is resilient and is curved adjacent to the lower end of the bracket 70. When the contact finger 69 is carried to its lowermost position, it will have passed under the resilient end portion of the return plate 74. On the upward movement of the operating rod 34, the contact finger 69 will be engaged by the upper face of the downwardly curved end portion of the return plate 74 and be carried over the projecting fingers 72, thus eliminating flashing of the electric lamps in the auxiliary housing 66 during the return movement of the gates. The contact finger 69 is of flexible material and as soon as it comes to the upper end of the return plate 74 it will snap back into normal position as shown in Fig. 7. 67[a] is the continuation of the conductor 67 from the plate 71, the ends of the conductors 67[a] and 68 being connected to any source of electrical supply.

The foregoing specification and annexed drawings disclose the preferred embodiment of my invention, but it is to be understood that minor changes may be resorted to in the commercial adaptation of my invention without departing from the scope of the invention as hereinafter claimed.

What I claim as new is:

1. In combination with a railroad crossing gate, a means for operating the same, comprising a bell-crank pivotally mounted relative to said gate and having one arm connected thereto; an operating wheel, having a cam slot formed therein; an operating rod pivotally connected to the other arm of said bell-crank; a pin carried by said rod and extending through said slot; and means for rotating said wheel to operate said rod.

2. In combination with a railroad crossing gate, a means for operating the same, comprising a bell-crank pivotally mounted relative to said gate and having one arm connected thereto; an operating wheel, having a cam slot formed therein; an adjustable operating rod pivotally connected to the other arm of said bell-crank; a pin carried by said rod and extending through said slot; and means for rotating said wheel to operate said rod.

3. In combination with a railroad crossing gate, a means for operating the same, comprising a bell-crank pivotally mounted relative to said gate and having one arm connected thereto; an operating wheel, having a cam slot formed therein; an operating rod pivotally connected to the other arm of said bell-crank; a pin carried by said rod and extending through said slot; means for rotating said wheel to operate said rod; and means for supporting said rod for longitudinal reciprocal movement.

4. In combination with a railroad crossing gate, a means for operating the same, comprising a bell-crank pivotally mounted relative to said gate and having one arm connected thereto; an operating wheel, having a cam slot formed therein; an operating rod pivotally connected to the other arm of said bell-crank, one end of said rod being bifurcated and straddling said wheel; a pin carried by said rod and extending through said slot; and means for rotating said wheel to operate said rod.

In testimony whereof, I affix my signature.

ARTHUR EARNEST ALEXANDER.