

June 19, 1923.

1,459,505

H. F. GUTH

GATE

Filed Aug. 15, 1921

2 Sheets-Sheet 1

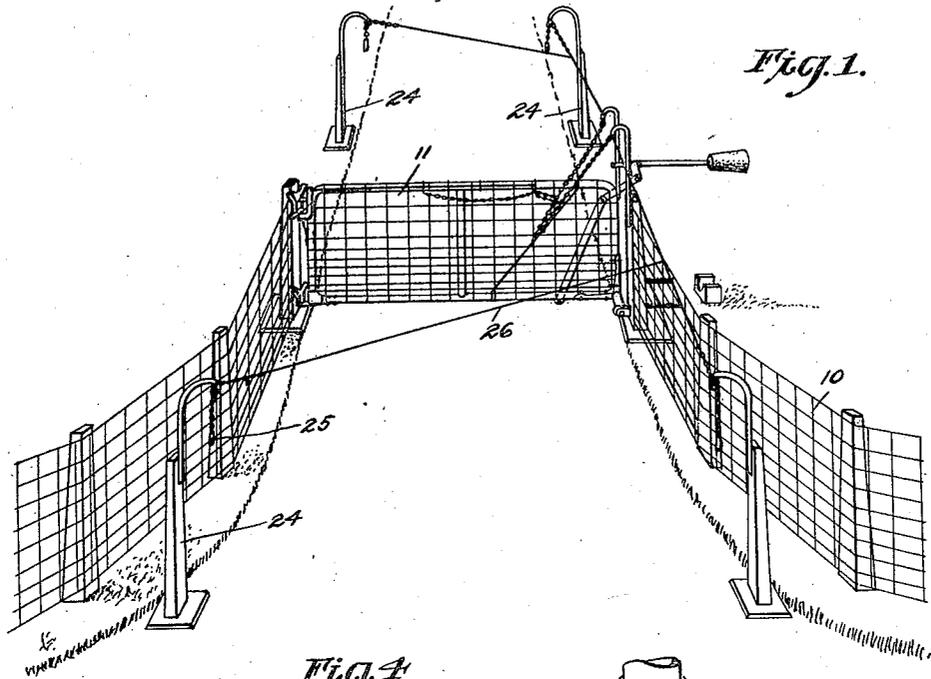


Fig. 1.

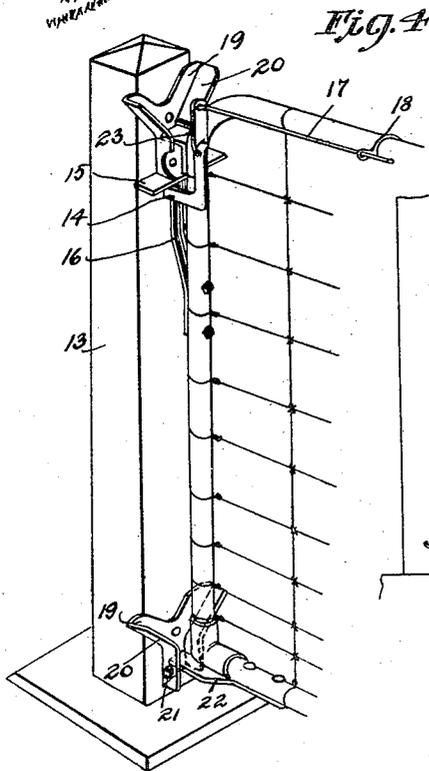


Fig. 4.

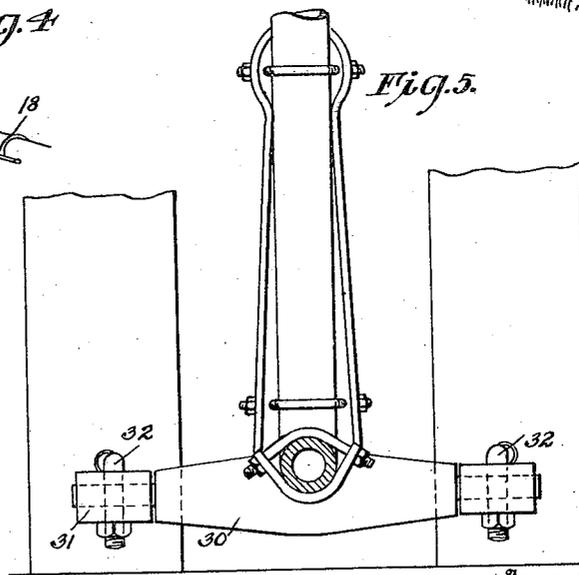


Fig. 5.

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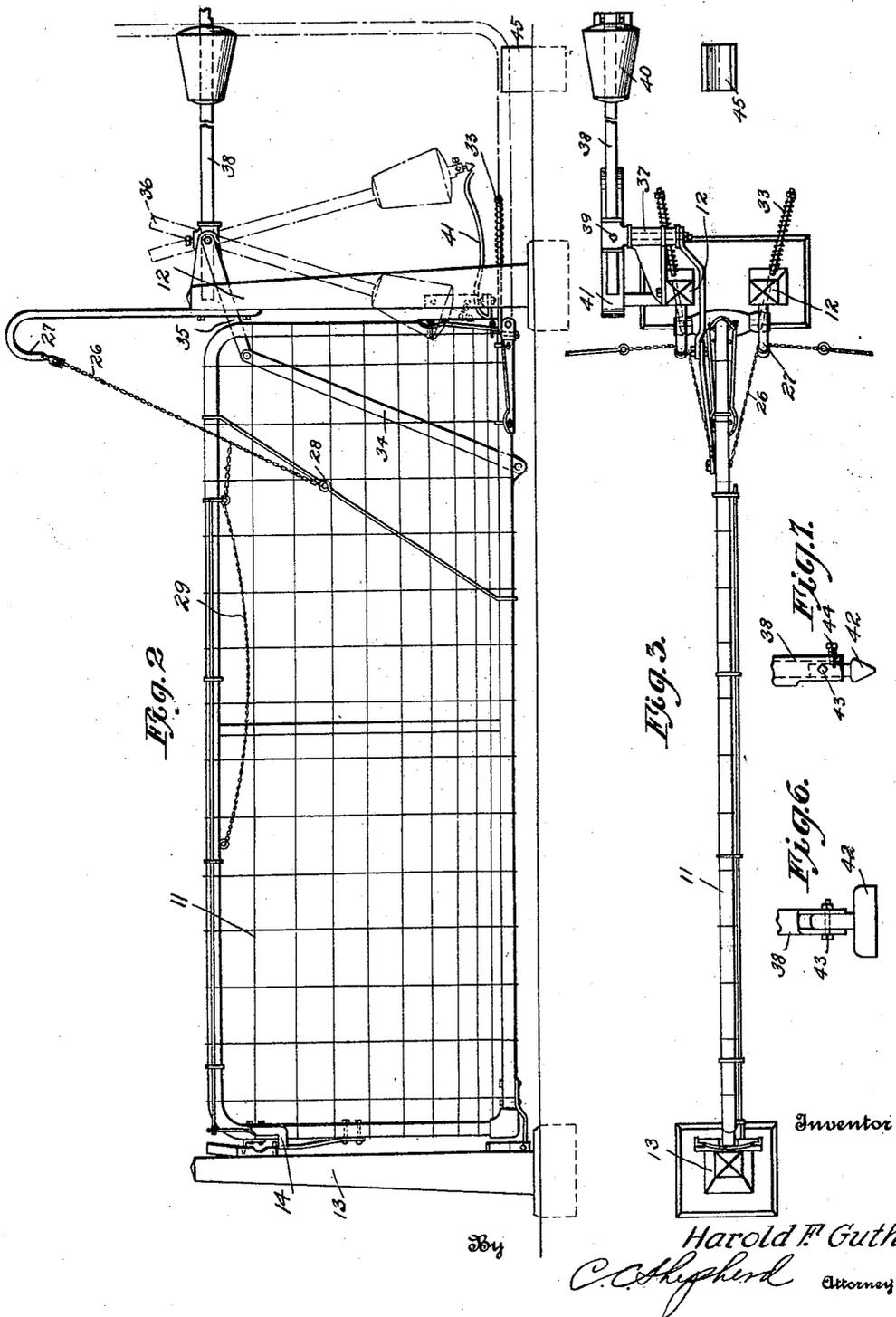
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2 Sheets-Sheet 2



# UNITED STATES PATENT OFFICE.

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## GATE.

Application filed August 15, 1921. Serial No. 492,502.

*To all whom it may concern:*

Be it known that HAROLD F. GUTH, a citizen of the United States, residing at London, in the county of Madison and State of Ohio, has invented certain new and useful Improvements in Gates, of which the following is a specification.

My invention relates to a gate and aims to provide a device of this nature more particularly known as a semi-automatic gate. In connection with gates and more particularly that type of gate which is known as a semi-automatic or driving gate, it is well appreciated that it has been customary to provide a gate capable of swinging in either a horizontal or vertical plane, together with certain actuating means which would serve to swing the gate from a closed to an open position and vice versa.

It has further been customary to provide this actuating means in the form of handles connecting with cables, which handles were associated with posts or other suitable supporting means situated in advance and to the rear of the gate, these posts being both upon one side of the roadway.

It has now quite often been found that the driver of an automobile or a horse drawn vehicle, is seated upon that side of the vehicle opposite from the side of the road upon which the post and its associated gate actuating means is situated. Thus, it is necessary that the driver leave his seat to operate the gate so that the same is in open position, return to his seat and drive the vehicle through the gate subsequent to which it is again incumbent upon the driver to move to cause the gate to close. This defect is entirely independent of the objectionable feature which in many types of gates, renders the operation, on the part of the pedestrian, of one of these gates extremely difficult.

It is further appreciated in connection with a gate of this type and more particularly in vertically swinging gates that the slightest unusual jar such as for instance would occur in a violent wind would result in a breakage, or disalignment of the operating parts of the gate. This is entirely aside from any minor accident such as the vehicle colliding with small force against the gate, in which latter instance extensive repairs have usually been necessary.

Finally, vertically swinging gates, as well as horizontally swinging gates, have been difficult to operate in view of the fact that the gate and operating mechanism therefor was not counter-balanced with that degree of nicety insuring an efficient operation.

Having the above defects in mind, I have now constructed a gate and more particularly a vertically swinging gate, in which the actuating mechanism therefor would be arranged in such a manner as to be accessible to the drivers of all vehicles, for both opening and closing the gate so that it would not be incumbent upon them to alight from the vehicle to accomplish this result.

A further object of my invention is the construction of a gate in which the operating parts will be so arranged that the gate will be entirely capable of sustaining shocks incident to its operation, without suffering damage, or if the shock should be so severe as to result in a partial dismantling of the gate, the damage may be quickly and readily repaired.

A still further object of my invention is the construction of a gate which shall be mounted and balanced in such a manner that the same may be opened or closed with a minimum of effort, which is greatly to be desired.

A further object of my invention will appear in the annexed specification and drawings, which latter present one practical embodiment of my invention, and which—

Figure 1 is an elevational view of a gate unit constructed according to my invention.

Figure 2 is an enlarged side view of the gate and operating mechanism therefor.

Figure 3 is a plan view of the parts as illustrated in Figure 2.

Figure 4 is an elevational view of the forward end of the gate.

Figure 5 is a plan view of the rear portion thereof, and

Figures 6 and 7 illustrate details associated with the operating mechanism of the gate.

In these views, like reference numerals designate similar parts, and the reference numeral 10 indicates a fence of any desirable type which presents a gate-gap normally closed by means of a gate panel such as 11 forming a part of my improved type of gate.

Referring now more particularly to the mechanism permitting of an operation of the gate with the expenditure of but a minimum of energy, it is my purpose to provide a gate panel and mounting therefor, such gate panel swinging in a vertical plane and being counter-balanced by a weight insuring of the ready response of the gate panel to but a slight impetus. This purpose is accomplished by mounting the panel and the counter-balancing weight therefor in such a manner that the panel when intermediate its open and closed position, will be perfectly balanced. When moved past this point towards its closed position, the panel will overbalance the weight, thus accelerating the closing motion of the gate, but upon the gate being moved past this intermediate point towards its fully open position, the weight provided for this purpose will overbalance the gate panel with the result that the latter will gain impetus and be accelerated to its fully open position.

This result is accomplished by pivotally securing, in a manner hereafter more fully specified, the panel 11 to a pair of posts 12 clearly shown in Figure 3. The panel, as will be noted, swings through a vertical plane and the outer end of the same is adapted to lie in the closed position of the gate adjacent a latch post 13. The gate in its closed position is held from movement with respect to this latter post by virtue of a latch 14 normally engaging the under side of a latch plate 15 by virtue of any suitable type of spring 16 serving to cause the former to normally lie in this position. A retraction of the latch 14 is conveniently effected by a latch rod 17 passing through guide eyelets 18 provided for this purpose, so that upon a pull being exerted upon the rod 17 a retraction of the latch 14 will result, permitting this member to clear the latch plate 15.

Now with a view of providing suitable means which will serve, upon the gate being lowered, to guide the outer end of the same to its proper position, Y-shaped guide irons are associated with the latch post 13. These irons conveniently comprise a Y-shaped body portion 19 provided with outwardly extending flange 20 adjacent their side edges. In this connection, it is to be noted that the uppermost of the guide irons conveniently terminates in the latch plate 15 so that a single packed unit may be provided. The lower guide iron is provided with a stop 21 of any suitable character which is adapted to coact with a cushioning member such as a spring 22 positioned adjacent the outer end of the lower edge of the gate panel 11. It will now be understood that upon the panel swinging downwardly, that the outer end of the same will be moved to its proper position should any slight mis-

alignment of the operating parts of the same occur by virtue of the fact that the gate stud 23 associated with the panel 11 will engage the outwardly extending flanges 20 of the body portion 19, upon the descent of the panel simultaneous with the engagement of the spring 22 with the guide iron provided for this purpose adjacent the lower end of the latch post 13, thus guiding the gate to a point at which the outer edge of the panel will be in perfect alignment, i. e., its proper position with respect to the latch post 13. Upon the continuation of the downward swinging of the panel 11, the latch 14 will be retracted by virtue of the engagement of the spring 16 by the latch plate 15, subsequent to which the latch 14 will ride past the edge of the plate 15 and snap into the position indicated in Figure 4, thus preventing any further motion of the part of the panel 11 with respect to the fence. In this connection, it is to be noted that the panel 11 will have to move with a relatively large amount of speed to overcome the retarding action incident to the operation of the latch 14, insuring that these parts will be in their proper position upon the completion of the movement of the panel. Necessarily, it will be impossible to adjust the movements of the parts with that degree of nicety insuring this operation and an immediate stoppage of movement on the part of the panel; and with a view of cushioning any shocks incident to the closing of the panel 11, it will be noted that the spring 22 will coact with the stop 21 so that a cushioning action will be set up, thus insuring a gradual braking of the movement of the panel without any danger of the parts of the gate becoming injured.

Now with a view of providing operating mechanism for a gate in such a manner that it will be possible for an operator to actuate the gate panel irrespective of which side of a vehicle he may be occupying, supplement posts or stanchions 24 are provided, one pair being conveniently located in advance of the gate and upon each side of the roadway, the second pair being in a similar position to the rear of the gate, contrary to the conventional construction which provide a single post in advance of the gate, a second post being positioned to the rear thereof. Associated with each of the supplemental posts 24 is a handle 25, to which is conveniently connected a cable 26 extending over guide members 27 and having its inner end secured as at 28 to the panel 11. It is to be noted that a further cable or other suitable connecting member 29 has one of its ends secured to each of the cables 26, its opposite end being connected to the pull rod 17. Thus, upon a pull being exerted to one of the handles 25, assuming that the panel is in its closed position, a pull

is exerted upon the panel 11 by virtue of the cable 28 simultaneously with a retraction of the rod 17, effecting a release of the latch 14. Thus, the gate panel 11 is released from its locked position and is given a pull in an upward direction.

To now properly counter-balance the panel 11 so as to insure a ready response upon the part of the same, it is now primarily to be noted that the pivotal connection existing between the panel and the gate posts 12 is effected by providing a gate pivot clearly shown in Figure 5, which pivot preferably includes a rod 30 which has its ends rotatably housed in bearings of any suitable character 31, this rod being secured to the gate panel 11 in any convenient manner. Bolts 32 pass one through each of the gate posts 12 and have their inner ends engaging and supporting the bearings 31. Springs 33 are conveniently interposed between the gate posts 12 and the outer ends of the bolts 32, thus retracting the latter to a position at which the pivot bearing will be firmly held against the faces of the gate posts.

It will be noted that the bolts 32 extend through the posts 12 at an angle and it will be understood that any jars incident to operation of the gate, even though the same may be somewhat unusual such as the slight collision on the part of a vehicle and the gate panel, that the pivot thus provided will be capable of giving so that a movement of the panel may be effected with respect to the supporting posts 12, without any material injury of the operating parts of the gate resulting.

Referring now more particularly to Figure 2, it will be seen that an actuating link 34 has one of its ends pivotally secured adjacent the lower edge of the panel 11, its upper end being pivotally associated with an actuating arm 35, which latter is rigidly affixed to a pivot shaft 36 rotatably secured by means of any suitable type of bracket 37 to one of the posts 12. Associated with the opposite end of the shaft 36 is an arm 38, which latter is conveniently slidably secured to the shaft 36 and is affixed in any desirable position by any suitable means such as a set screw 39. By this latter construction, the length of the arm 38 may be varied and the leverage exerted by means of the weight 40, which is affixed to the outer end of the arm, may accordingly be varied.

For a purpose hereinafter more fully specified, a spring 41 is provided at a point directly below the outer end of the arm 38. A pawl, more particularly shown in Figures 6 and 7 is associated with the outer end of the arm 38, which pawl may be of any convenient type such as a foot 42 pivotally secured as at 43 to the arm 38 and provided

with a stop 44, which permits of the swinging of the foot 42 in but one direction.

It is now to be noted that the actuating arm 35 is of less length than the distance between the point of pivotal connection of the link 34 and panel 11 and the pivot existing between the gate post 12 and the latter. Thus formed, the panel 11 swinging through an arc of substantially  $90^\circ$ , i. e., to the position indicated in dotted lines in Figure 2, at which the inner edge of the panel 11 seats upon the rest 45, the weight 40 and its associated arm 38 will travel through an arc greater than  $90^\circ$ , in other words, to the extreme position indicated in dotted lines in Figure 2. It will readily be appreciated that by this construction when the gate is half way open, that it is perfectly balanced by the weight and will remain at rest at this point (assuming that the length of the arm 38 has been adjusted so that the proper leverage is secured). If the gate is now given an impetus towards its closed or lowered position, it will continue to gain momentum until it reaches this position and is locked by the latch, the guide irons insuring it proper position on the outer end of the gate. As has been afore described, the spring 22 will reduce and gradually retard the momentum of the gate, so that any unusual jar incident to the same reaching its closed position is eliminated.

Assuming again that the gate is half raised, i. e., in this balanced position, it will be appreciated, assuming that an impetus in an upward direction is imparted to the panel 11, that by virtue of the arrangement of the actuating arm and pivotal mounting of the gate, the weight 40 will actuate the same in such a manner that the momentum of the panel movement in an upper direction is increased. Thus, the center position, i. e., the position in which the parts perfectly counter-balance one another might be said to represent the "dead center" position of the gate so that upon the panel 11 being moved through a vertical plane either upwardly or downwardly, this motion will be continued and accelerated to a point resulting in a complete opening or closing of the gate panel. As afore stated, the gate will now move to its fully open position and this motion will be continued and accelerated to a point at which the pawl associated with the outer end of the arm 38 strikes the spring 41 and it will be understood that by virtue of the frictional engagement incident upon this operation taking effect, the motion of the panel will be retarded. Also, by reason of the arrangement of the spring 41, the outer end of the arm 38 will meet with increasing resistance to a point at which the motion of the arm and consequently the panel 11 are nearly

checked, at which point the latter will be in almost its full position. Upon the arm reaching a point at which the momentum of the same is more than offset by the increasing frictional engagement of the spring, a slight rebounding motion on the part of the panel will come into being, which rebounding motion will result in the pawl opening, thus releasing the tension existent between the spring 41 and outer end of the arm 38. This will then permit the panel to gently settle upon the rest 45, the arm 38 and its associated weight 40 moving to the final position indicated in dotted lines in Figure 2, thus perfectly counter-balancing the panel and preventing any accidental closing of the gate.

A closing of the gate may now be effected by a second pull upon any of the cables 26, which pull in the nature of a jerk will impart to the panel sufficient momentum to permit it reaching its "dead center" position, below which point, as afore described, the closing will automatically continue. As has been afore described, the same pull or jerk when the gate has been closed will reverse the operation, with the exception that in addition to the movement of the parts described, the latch rod 17 will be actuated to effect release of the latch 14.

Thus, I have constructed a gate which shall be extremely easy to operate in that the parts are semi-automatic in operation, the actuating means therefor being entirely accessible from any type of vehicle or being capable of operation on the part of a pedestrian from any number of different points.

It will further be appreciated that I have constructed a gate which is mounted in such a manner that, as afore described, the parts will always remain in alignment, not only upon receiving jars incident to normal op-

eration, but also in the event of being subjected to extremely rough usage.

Obviously, numerous modifications of structure might readily be resorted to without in the least departing from the scope of my claims, which are:

1. A gate including a gate panel, a supporting means for said gate panel, and pivoting means associated with said supporting means and attached to said panel for permitting a swinging movement of said panel through its normal plane of travel and also permitting of a limited movement of said panel in a plane transverse to said normal plane of travel.

2. A gate including in combination gate posts, a gate panel pivotally secured to said gate posts, a shaft, means extending between said shaft and panel for moving the latter, a lever attached to said shaft, a weight secured to said lever, said weight and lever being adapted to swing downwardly upon said panel being moved to its open position, means co-operating with the outer end of said lever for retarding the movement of the same upon said weight swinging downwardly, and means for releasing said retarding action.

3. A gate including in combination gate posts, a gate panel pivotally secured to said gate posts, a shaft, means extending between said shaft and panel for moving the latter, a lever attached to said shaft, a weight secured to said lever, said weight and lever being adapted to swing downwardly upon said panel being moved to its open position, means co-operating with the outer end of said lever for retarding the movement of the same upon said weight swinging downwardly, and means for automatically releasing said retarding action.

In testimony whereof I affix my signature.

HAROLD F. GUTH.