

J. F. KUNKLE.  
GATE.  
APPLICATION FILED JAN. 5, 1912.

Patented Dec. 17, 1912.

2 SHEETS—SHEET 1.

1,047,248.

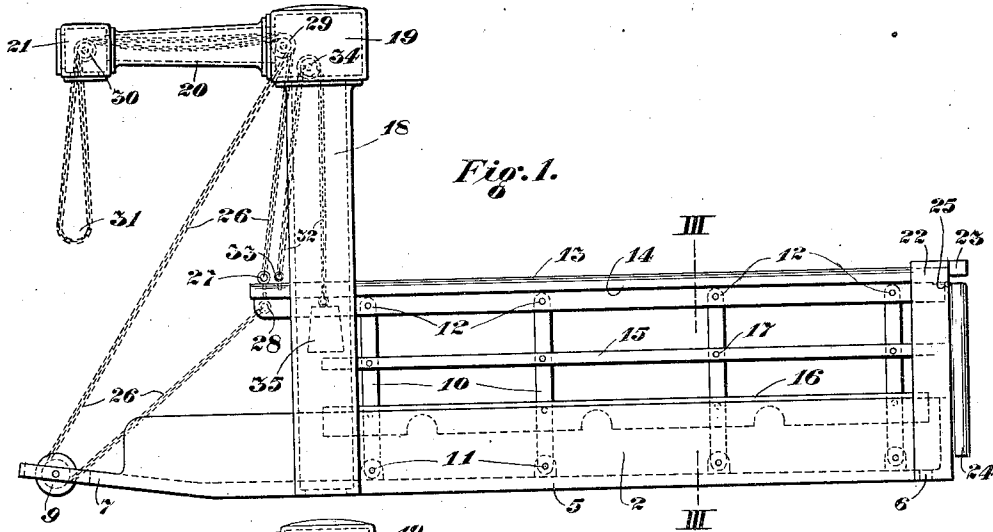


Fig. 1.

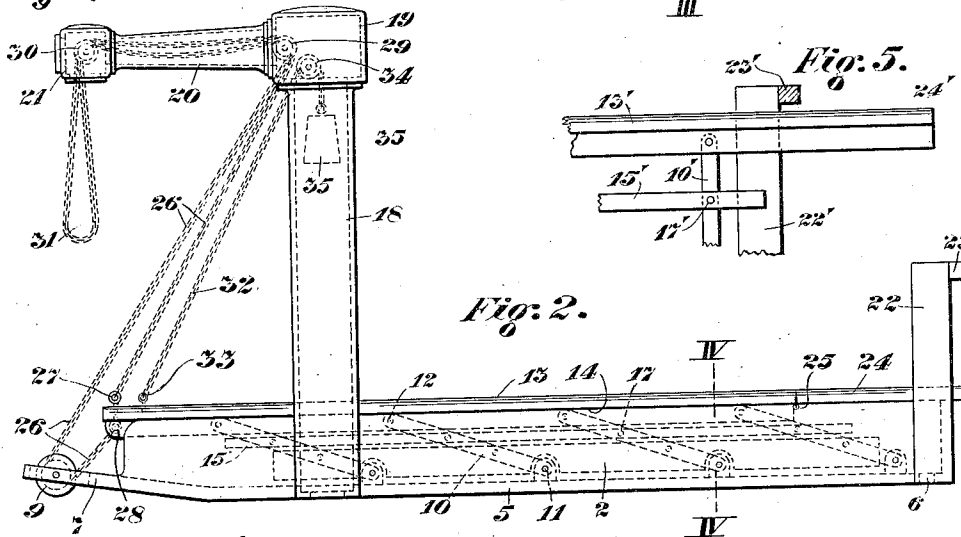


Fig. 2.

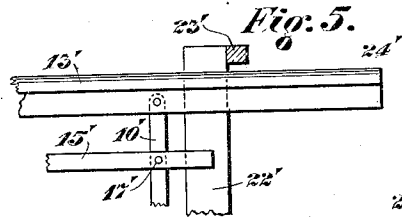


Fig. 5.

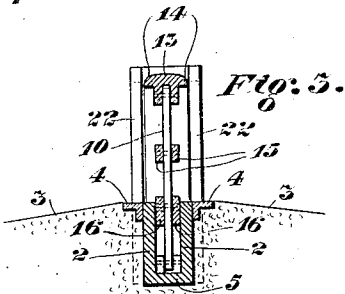


Fig. 3.

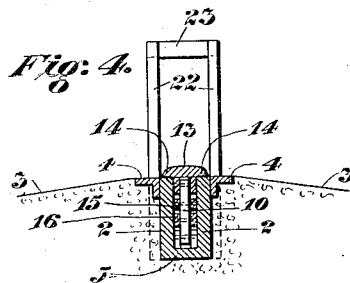


Fig. 4.

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Inventor:

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his attorney

J. F. KUNKLE.

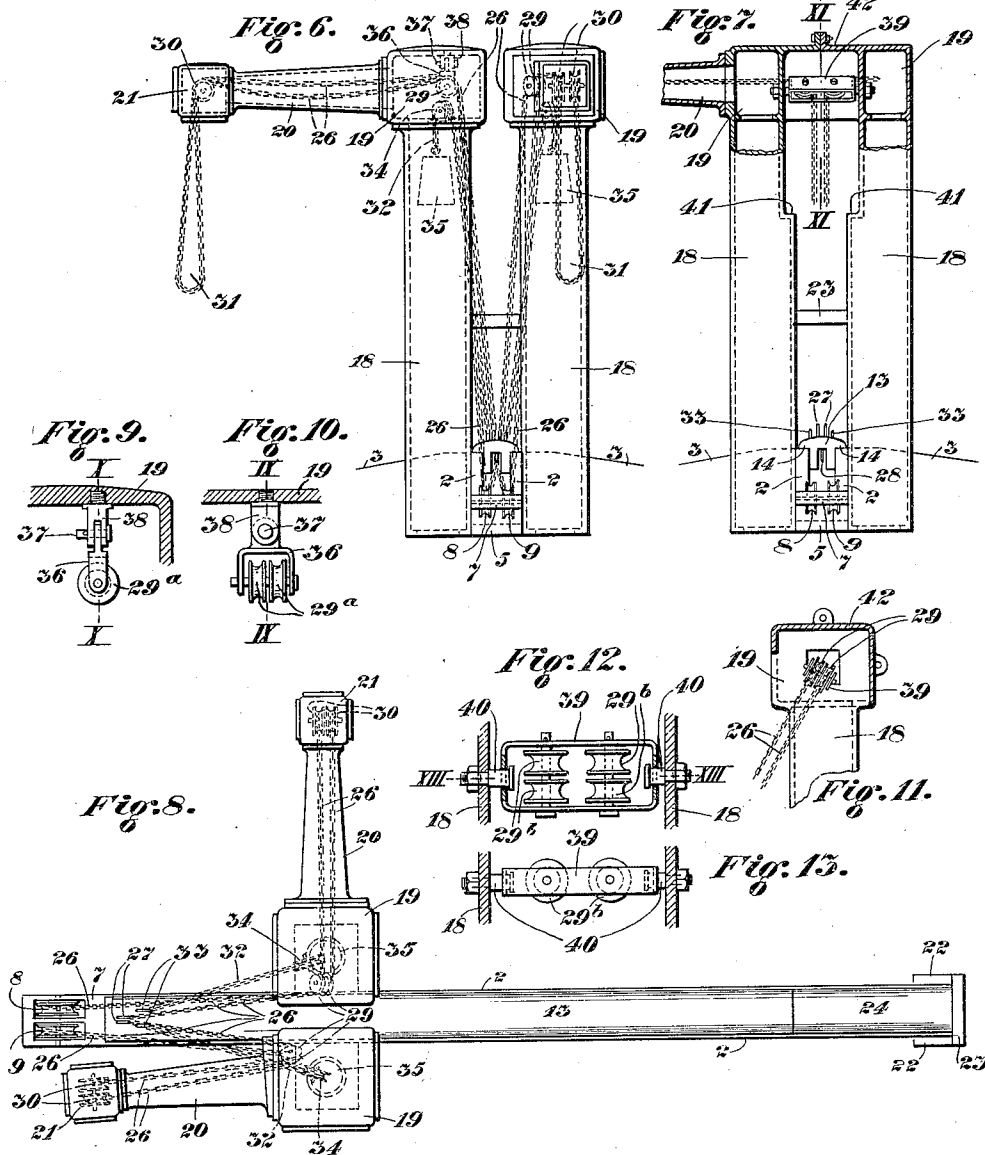
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2 SHEETS—SHEET 2.



Witnesses:

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# UNITED STATES PATENT OFFICE.

JAMES F. KUNKLE, OF MIDWAY, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO JOHN A. CROWLEY, OF McDONALD, PENNSYLVANIA.

## GATE.

1,047,248.

Specification of Letters Patent.

Patented Dec. 17, 1912.

Application filed January 5, 1912. Serial No. 669,564.

*To all whom it may concern:*

Be it known that I, JAMES F. KUNKLE, a citizen of the United States, residing at Midway, in the county of Washington and State of Pennsylvania, have invented certain new and useful Improvements in Gates, of which the following is a specification.

My invention consists of an improvement in vertically adjustable gates adapted to open and close a roadway, and is designed to provide a mechanism of this class operable by the driver of a vehicle from the roadway without alighting.

The invention consists in a box or housing located across the roadway, set downwardly and flush with the surface thereof; a collapsible gate pivotally mounted therein adapted to be raised and lowered; a vertical hollow framework construction provided with counterweight mechanism, and laterally extending hollow arms, and guiding sheaves mounted therein together with flexible raising and lowering connections secured to one end of the gate structure, passing around said sheaves, and terminating in operating loops whereby said connections are continuous at each side of the structure, and capable of raising or lowering by one of said single connections.

The invention is illustrated in the accompanying drawings in which—

Figure 1 is a view of the apparatus in side elevation showing the gate erected. Fig. 2 is a similar view showing the gate lowered. Figs. 3 and 4 are cross sectional views on the lines III. III. and IV. IV. respectively of Figs. 1 and 2. Fig. 5 is a detail view showing a modification. Fig. 6 is an end elevation of Fig. 2. Fig. 7 is a similar view showing a modification. Fig. 8 is a plan view of Fig. 2. Figs. 9 and 10 are detail views showing swivelly mounted sheaves, Fig. 9 being a section on the line IX. IX. of Fig. 10 and Fig. 10 being a section on the line X. X. of Fig. 9. Fig. 11 is a detail sectional view showing the interior top portion of one of the hollow columns, on the line XI. XI. of Fig. 7. Figs. 12 and 13 are detail sectional views in plan and elevation respectively, showing a further modified construction of the mounting of the grooved sheaves between the hollow columns.

A box or housing 2 is inserted across the roadway 3 having its top flush with the sur-

face thereof and preferably provided with laterally extending flanges or edges 4 lying flush with the roadway surface. The housing 2 is provided with a bottom 5 which is preferably somewhat inclined toward one end and provided with a drainage opening 6 of any suitable construction, whereby to carry off any accumulation of water. At the other end the bottom of the housing is extended and somewhat inclined upwardly, as indicated at 7, and provided with two sheaves 8, 9, respectively, journaled in said extension 7 or between the sides of the housing, as preferred.

The gate structure consists of a plurality of supporting bars 10, each of which is pivoted at 11, in suitable supporting bearings in the inner base portion of the housing, as shown. Pivotally secured to the upper ends of said uprights 10 at 12, is a top or cover 13 having a rounded upper surface and laterally extending edges 14, 14, adapted, when the gate is collapsed as in Fig. 2, to lie out over each upper edge of the housing and completely cover and protect it from the intrusion of any dirt or foreign matter. The uprights 10 are connected by a plurality of longitudinal bars 15, 15, pivotally connected with the uprights at the points of crossing thereof, as indicated at 17. The lowermost one, 16, of said bars is so arranged as to its vertical position that it will, when the gate is erected, extend slightly above the upper edges of the housing sides and also somewhat below said edges, as shown, whereby to seal the space as much as possible when the gate is erected to protect the interior. Said bars 15 and 16 are preferably double bars, located at each side of the uprights 10, whereby to fill the space between the sides of the housing.

At one end of the gate are located the main upright posts or columns 18, 18, which are hollow and are provided at their tops with hollow copings 19 from which extend laterally the hollow arms 20 having the hollow terminals 21. As shown in the plan view, Fig. 8, these arms 20 may be located at varying positions, *i. e.* one arm may extend at right angles from the housing 2 outwardly along the side of a roadway extending at right angles to the housing or crossing, while the other arm may extend backwardly substantially parallel with the gate structure and with the side of a road-

way running in the same direction as the gate. At the other end of the gate structure, I provide uprights 22, 22, having a cross bar 23, between which extends an adjustable tail section 24 of the top bar 13 of the gate. Said section is pivoted at 25 to the rear end of the main top bar, as shown, adapted to fall by gravity when the gate is erected, as in Fig. 1, and to lie down across the end of the housing when the gate is lowered, as in Fig. 2. If preferred, said tail may be rigid, as indicated at 24', Fig. 5.

For the purpose of operating the gate, to either raise or lower, I provide a continuous flexible connection, as a chain 26, one end of which is attached to the end of the top bar 13, as at 27, the other end being connected below said connection, as at 28. Said chain passes around the lower sheave 9 and then upwardly, with the other end portion of the chain, as shown, both of such portions then passing around the two guiding sheaves 29, 29, pivotally mounted within the coping 19. The double chain from said sheaves extends outwardly from the hollow arm 20 and around each one of a pair of similar sheaves 30 mounted in the hollow terminal 21, the surplus portion of the chain extending downwardly by gravity therefrom in the form of a loop 31. 32 is a similar connection, two of which are provided, each of which is connected with the end of the top bar 13, as at 33, and each of which passes upwardly and around a sheave 34, one of said sheaves being pivotally mounted within each hollow coping 19. To the end of each of said chains 32 is connected the counterweight 35 adapted to rise and fall throughout the hollow interior of each post 18, and to substantially counterbalance the weight of the gate in the operation of raising or lowering. If desired, the sheaves for chains 26 may be swiveled as indicated at 29<sup>a</sup>, Figs. 9 and 10, in carrying brackets 36 pivoted at 37 in supports 38 suspended from the top of the hollow coping 19 whereby to provide for free operation of the chains and adaptation of the sheaves to their varying inclinations in use. The sheaves 29<sup>b</sup> may also be mounted in a swiveled bracket 39 mounted on trunnion bearings or studs 40 on each inner side of each column 18, as clearly shown in Figs. 7, 12 and 13. With such construction clearance space is provided by off-setting the inner walls of the columns, as indicated at 41, Fig. 7, and a protecting roof or cover 42 is extended across the space to inclose the sheaves from the weather.

The construction and operation will be readily understood from the foregoing description, and the advantages of the invention will be readily appreciated.

What I claim is:

1. In a collapsible gate, the combination

of a hollow housing provided with upright hollow columns at one end, a pivotally connected gate structure pivotally mounted in said housing, hollow arms extending laterally from the tops of said columns, guiding sheaves mounted in the housing columns, and arms, and flexible operating members secured to the end of the gate structure and passing around said sheaves, substantially as set forth.

2. In a collapsible gate, the combination of a hollow housing provided with upright hollow columns at one end, a pivotally connected gate structure pivotally mounted in said housing, hollow arms extending laterally from the tops of said columns, guiding sheaves mounted in the housing columns, and arms, and flexible operating members secured to the end of the gate structure and passing around said sheaves, and terminating in loops depending from the ends of said arms, substantially as set forth.

3. In a collapsible gate, the combination of a hollow housing provided with upright hollow columns at one end, a pivotally connected gate structure pivotally mounted in said housing, hollow arms extending laterally from the tops of said columns, guiding sheaves mounted in the housing columns, and arms, flexible operating members secured to the end of the gate structure and passing around said sheaves, and additional flexible members connected to the gate structure and passing over supporting sheaves in the columns and provided with terminal counterweights, substantially as set forth.

4. In a collapsible gate, the combination of a hollow housing set substantially flush with the roadway, a collapsible gate pivotally mounted in the bottom of the housing, hollow columns extending upwardly at each side of said housing each having a laterally extending hollow arm, guide sheaves mounted in the housing and arms, guide sheaves located below the upper portion of the gate, and flexible actuating connections attached to the gate and passing around said sheaves and embodying a grasping loop depending from the ends of said arms, substantially as set forth.

5. In a collapsible gate, the combination of a hollow housing set substantially flush with the roadway, a collapsible gate pivotally mounted in the bottom of the housing, hollow columns extending upwardly at each side of said housing each having a laterally extending hollow arm, guide sheaves mounted in the housing and arms, guide sheaves located below the upper portion of the gate, flexible connections attached to the gate and passing around supporting sheaves in the upper portion of the column and provided with terminal counterweights, and flexible actuating connections attached to the gate and passing around said sheaves and em-

bodying a grasping loop depending from the ends of said arms, substantially as set forth.

5 6. In a collapsible gate of the class described, the combination with the hollow housing set substantially flush with the roadway, of a gate consisting of a plurality of upright members pivotally mounted in the bottom of the housing, longitudinal cross  
10 bars pivoted to the upright members, a top bar pivoted to the tops of the upright members and having a projecting tail extension pivotally connected to the top bar, and upright guide posts providing bearings there-  
15 for, substantially as set forth.

20 7. In a collapsible gate of the class described, the combination with the hollow housing, a collapsible gate pivoted therein, and upright posts at each side of the housing having laterally extending arms, of a plu-  
25 rality of swivelly mounted guiding sheaves mounted at the upper portion of the posts, guide sheaves on one end of the housing, and guide sheaves at the outer ends of the arms, and flexible connections attached to the end of the gate passing around said sheaves and

embodying depending loops supported below the ends of said arms, substantially as set forth.

8. In a collapsible gate of the class de- 30 scribed, the combination with the hollow housing, a collapsible gate pivoted therein, and upright posts at each side of the housing having laterally extending arms, of a plu-  
35 rality of swivelly mounted guiding sheaves mounted at the upper portion of the posts, guide sheaves on one end of the housing, and guide sheaves at the outer ends of the arms, flexible connections attached to the end of the gate passing around some of said sheaves 40 and having terminal counterweights, and flexible connections attached to the end of the gate, passing around other of said sheaves and embodying depending loops supported below the ends of said arms, sub- 45 stantially as set forth.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

JAMES F. KUNKLE.

Witnesses:

C. M. CLARKE,  
FREDK. STAUB.