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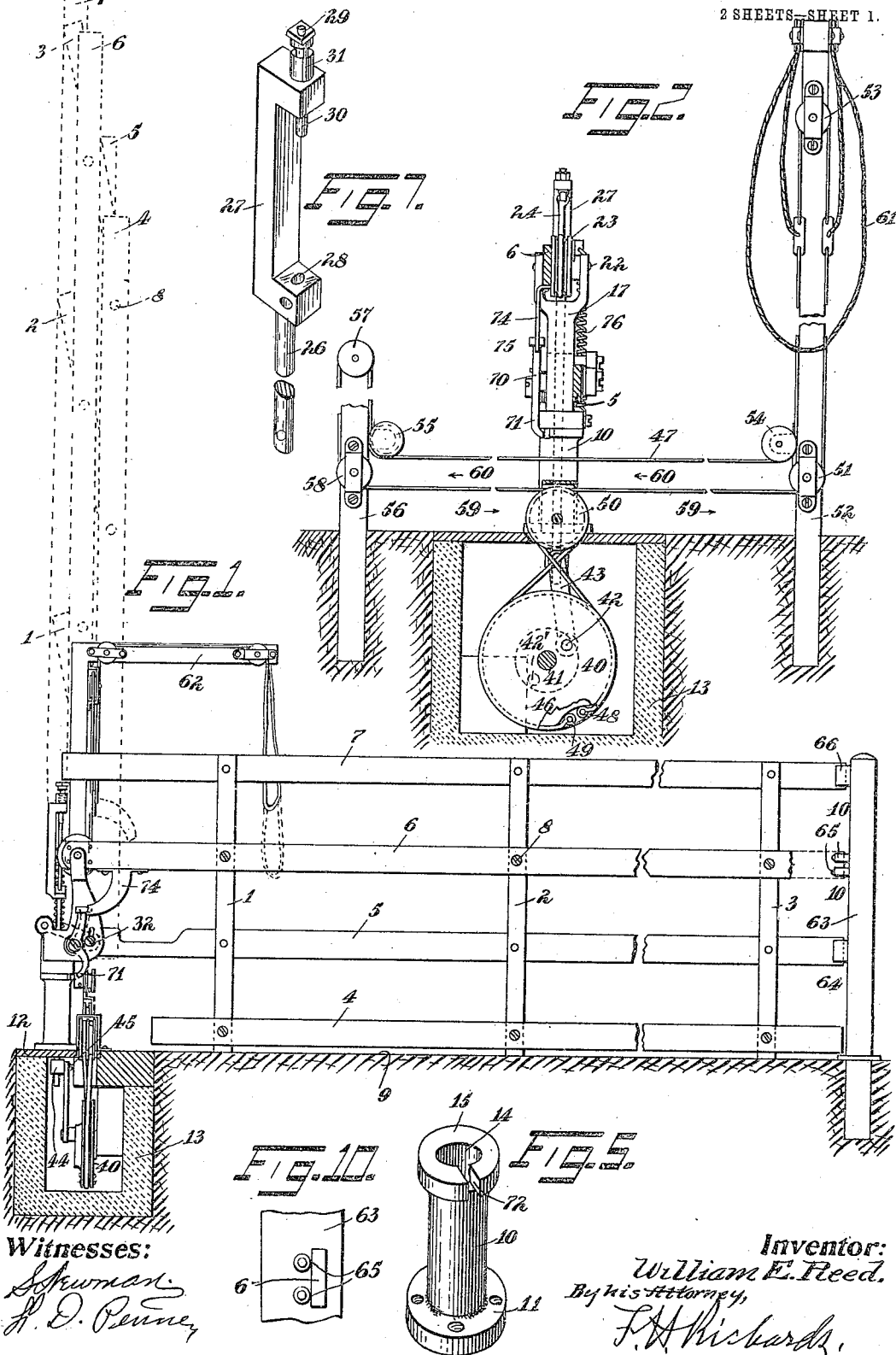
GATE.

APPLICATION FILED DEC. 26, 1908.

952,758.

Patented Mar. 22, 1910.

2 SHEETS—SHEET 1.



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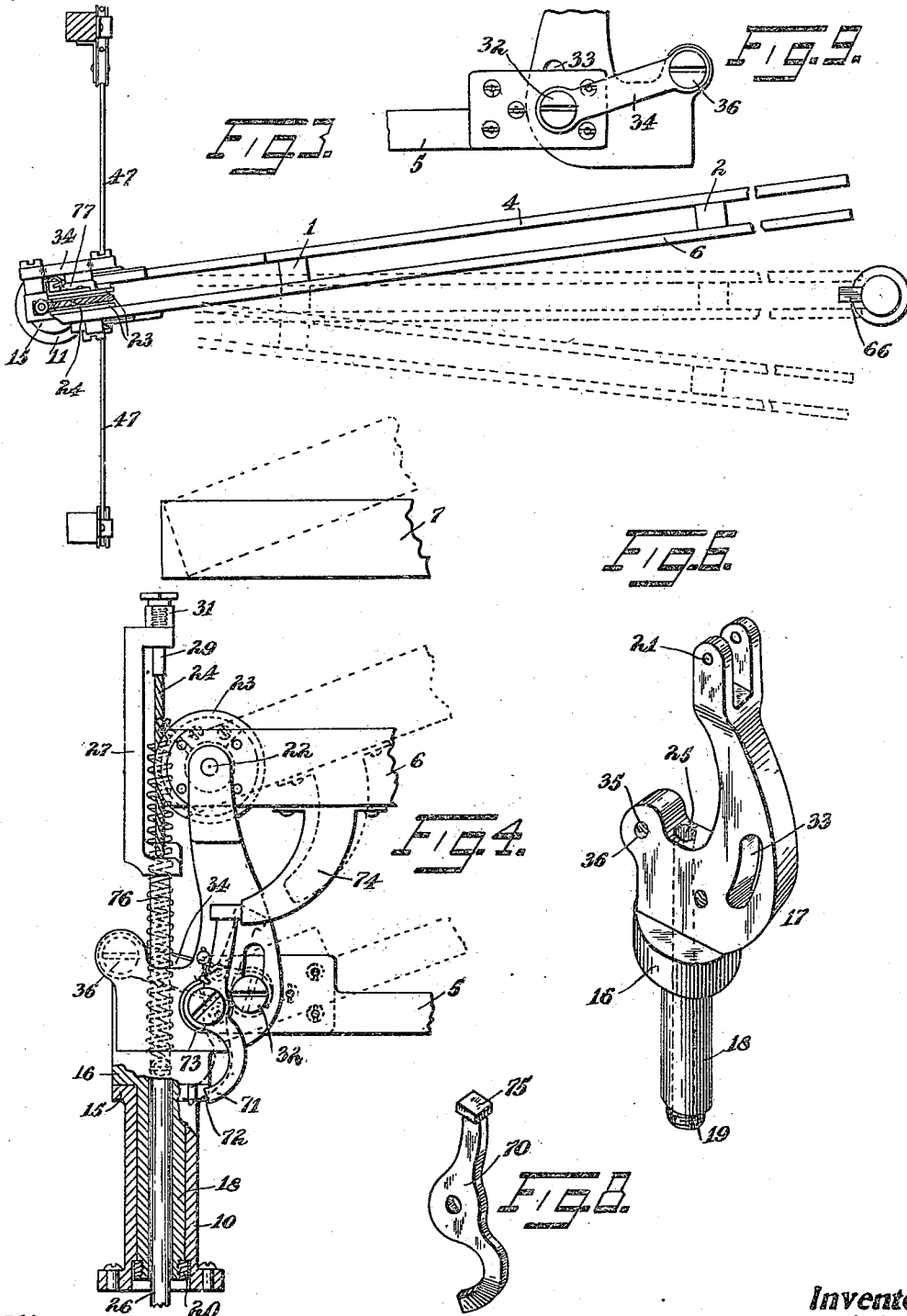
By his Attorney,

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2 SHEETS--SHEET 2.



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UNITED STATES PATENT OFFICE.

WILLIAM E. REED, OF CLEVELAND, OHIO.

GATE.

952,758.

Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed December 26, 1908. Serial No. 469,392.

To all whom it may concern:

Be it known that I, WILLIAM E. REED, a citizen of the United States, residing in Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Gates, of which the following is a specification.

This invention relates to gates and has for an object to provide improved operating mechanism therefor.

A gate of improved construction is illustrated which may either be swung upon a vertical or upon a horizontal axis and may be operated from a distance.

The operating mechanism shown includes means for preventing the gate from turning upon the vertical axis after it has been raised a certain amount upon the horizontal axis. It also provides efficient means for holding the gate in a raised position.

The construction of the gate herein illustrated is such that it may fold compactly so that its various parts will lie closely together and the folded up structure will assume a vertical position.

The various details making for the efficiency and the practicability of the gate will be developed in proper order in the description which follows.

In the accompanying drawing forming a part of this specification a practical embodiment of my gate is illustrated.

Figure 1 shows an elevation of the gate and its operating mechanism. Fig. 2 shows a cross section of the gate illustrated in Fig. 1 taken adjacent to the hinge or post portion of the gate, and looking toward the same. Fig. 3 is a top plan view of the gate illustrated in Fig. 1. Fig. 4 is an enlarged view partly broken away and partly in section of the hinge portion and certain of the associated mechanism. Fig. 5 is a perspective view of a portion of the gate post. Fig. 6 is a perspective view of another portion of such gate post and which portion constitutes a hanger for the gate. Fig. 7 is a perspective view of a portion of the operating mechanism. Fig. 8 is a perspective view of a latch for preventing rotation of the gate upon its vertical axis. Fig. 9 is a detail of certain of the parts illustrated in Fig. 4 viewing these from the opposite side, and Fig. 10 is a diagrammatic view of certain of the parts at the "latch" end of the gate.

This gate is useful in many situations and is particularly adapted for use as a farm

gate where it is desired to provide means whereby the gate may be opened by a person in a wagon or on horse-back who after passing through may close the gate. In these gates it is desirable that they should be capable of being readily swung, as for instance to permit a man to pass through without raising them up, when being raised up that they should not revolve or turn on the vertical axis, and when raised that they should be put up in a substantially vertical position, the parts compact, and there be suitable means to hold the gate in such position to prevent accidental closing. These desirable ends among some others are served in the present gate.

The gate herein is shown made up of some bars which when the gate is closed are in a vertical position and for this reason will be called the vertical bars. Three of these bars designated by the reference characters 1, 2 and 3 are illustrated herein which bars are connected together by other bars which from the fact that when the gate is in its normal or closed position are in a horizontal position will be called horizontal bars. Four of these bars are illustrated herein which for convenience have had applied to them the reference characters 4, 5, 6 and 7. It will be seen that the horizontal bars are alternately disposed upon opposite sides of the vertical bars, that is the bars 5 and 7 are on one side of the vertical bars and the bars 4 and 6 are on the opposite side. This arrangement permits the gate to fold up in a compact form when it is raised in a vertical position and incidentally also adds strength and rigidity to the gate structure. The bars of course are fastened together by some suitable pivots designated without preference with the reference character 8. In the construction illustrated in Fig. 1 the vertical bars rest upon the surface 9 of the ground and thus support the weight of the gate.

The member which may be called the gate post is illustrated in perspective in Fig. 5, and in the drawings bears the reference character 10. This comprises in the present instance a standard provided with a flange 11 which may be bolted or otherwise suitably secured to some suitable base 12 which may rest upon the ground or upon a concrete pit 13 which is provided in the present illustration for housing certain portions of the operating mechanism. This gate post has a pivot seat or socket 14 and a flange 15, the

upper face of which constitutes a bearing surface for the lower face of the flange 16 carried by the hanger portion which is illustrated in Fig. 6 and is designated in a general way by the reference character 17. The hanger is provided with a pin 18. In the illustration the pin projects downwardly and the shoulder afforded by the flange 16 is adjacent to the upper portion of the pin. The socket 14 will normally support the pin in a substantially vertical position. In some situations, and especially in light weight structures, it is desirable at times to remove the pin from the pin seat or socket portion and the pin, and post connection herein illustrated afford an efficient means of support yet one which may be readily disconnected when desired. For permitting the gate to turn on a vertical axis the pin 18 will constitute a pivot and the socket 14 a bearing therefor. The lower end of the pin is shown as screw-threaded at 19 for receiving a nut 20 which will engage a shoulder formed upon the lower portion of the member 10 and hold the flanges 15 and 16 in engagement. These parts provide the vertical axis for the gate upon which it may horizontally swing.

The hanger at a portion upstanding above the pin 18 is provided with a pivot bearing 21 for supporting a pivot 22 to constitute the horizontal axis of the gate about which it will swing vertically. This pivot 22 will be secured to the gate in a suitable manner, in the present illustration it is shown as carried by one of the horizontal bars namely the horizontal bar 6. A sheave 23 is also carried by the bar 6 and is arranged in the present illustration concentric with the pivot 22 and about this sheave is wrapped a flexible connection in the form of a belt 24. This flexible connection may be fastened to the sheave to prevent slipping. It will readily be seen that by moving the belt in one direction or the other, the sheave will be rotated, and since it is fast with a portion of the gate, it will cause the gate to revolve upon the horizontal axis namely the pivot 22. The pivot bearing 21 and pin 18 are disposed transversely one to the other.

The hanger is provided with a socket 25 for supporting and guiding a portion 26 of the reciprocatory member 27 to which member the ends of the connection 24 will be secured. In the present illustration there is provided a hole 28 through which one end of the connection 24 may be passed, which connection preferably will be made out of metallic cable, and after passing through the hole 28 will have a knot or suitable enlargement made at the end. The other end will pass through the opening 29 in an adjusting member 30 which member is provided with screw-threads for engagement with a nut 31 for taking up slack and if de-

sired putting the proper amount of tension upon the member 24. By the reciprocation of the actuator 27 the sheave 23 will be rotated and the gate raised or lowered as the case may be.

For the purpose of causing the bars of the gate to fold together these, with the exception of the bar controlled by the actuator, in the present illustration bar 6, must be held from turning about the axis of such actuator controlled bar. For this purpose the horizontal bar 5 is shown as provided with a pivot 32 having a bearing in the hanger. The axis of the pivot 32 is not in the vertical plane of pivot 22. The bar thus held from rotation on the axis of the actuator controlled bar in the present illustration is below such bar, when the bars of the gate are folded together the "horizontal" bars will all be in a vertical position and closely assembled, with the bar 5 a little to the front of bar 6. Bars 4 and 6 will be edge to edge as will also bars 5 and 7. The median longitudinal line of bar 6 will be opposite the line of contact of the edges of bars 5 and 7. Not only must there be provided two pivotal axes, but one of these must be free to move relatively toward and from the other to effect the compact folding. The hanger is shown provided with a slot 33, constituting a bearing for the pivot 32, which is of sufficient length to permit the desired relative movement of the axes. For the purpose of assuring a more uniform movement and for preventing a certain amount of end thrust the guided pivot 32 is connected by a link 34 with a portion 35 of the hanger located at some distance from the slot 33 and in such position that its pivotal point 36 will be a center from which formation of the slot 33 is struck. In the normal position of the bars the link will be on the side of the pivot opposite to that on which the bar 5 is carried. The link and the slot coöperate in the desired result and supplement the effect one of the other.

The means herein illustrated for reciprocating the actuator 27 comprises a sheave 40 which in the present instance is mounted upon a stub shaft 41 suitably supported in the pit 13. The sheave is shown as carrying a crank wrist 42, and a connecting rod 43 connects the crank wrist 42 with the reciprocatory actuator by being fastened to the portion 26 thereof by a suitably adjustable clamp 44 having a wrist 45 for the engagement of the connecting rod. It will thus be seen that upon the oscillation of the sheave 40 the gate will be raised and lowered.

The means herein provided for holding the gate in its raised position is the proper set or timing of the crank wrist so that it will be upon or slightly past the dead center when the gate has been raised to its full open position. For the purpose of preventing

overthrow, a stop 46 is provided for engaging and limiting the movement of the crank wrist and stopping this when it has raised the gate and passed the dead center, otherwise continued stress upon the actuating ropes would cause the gate to prematurely descend.

It is frequently desirable to operate these gates from a distance and to have operating devices upon both sides. In the present instance the complete mechanism upon one side only is illustrated and a suitable flexible connection as for instance a rope designated herein by the reference character 47, is shown as having its ends connected to the sheave 40 at 48 and 49 passing around the perimeter of such sheave and being crossed for passing around a sheave 50. By reference to Fig. 2 it will be seen that the end which is secured at 48 will pass around the right hand side of the sheave 40, the left hand side of the sheave 50 and then pass toward the right around the sheave 51, carried by the post 52, around the sheave 53 also carried by said post, then down and around the sheave 54 past the gate to a sheave 55 upon the other post 56. It will pass around a sheave 57, and 58, also carried by said post, then around the right hand side of the sheave 50, the left hand side of the sheave 40 to the fastening 49. By causing the lower rope to move in the direction of the arrows 60, the gate will be raised. By causing the lower rope to move in the direction of the arrows 59, the gate will be lowered. When the crank wrist 42 reaches the dotted line position 42' illustrated in Fig. 2, it will have passed its dead center downwardly which is its natural movement bearing the weight of the gate and will engage the stop 46 which will hold it in this position and lock the gate in its raised position. A suitable hand rope 61 is provided for actuating the rope 47 and this may be carried by a suitable arm 62 of the post 52. The post which is generally called the latch post of the gate, is designated herein by the reference character 63, and is provided with what may be termed an interrupted web for engagement between the horizontal bars 5—7 and 4—6. This web in the present instance is shown as comprising portions 64, 65 and 66. 65 is composed of a roller or roller members. These portions of the divided web will guide the ends of the horizontal bars in the proper course as they pass down or up as the gate is being lowered or raised and are so related that when the gate is at its down position they will prevent movement of the gate in either direction on its vertical axis. A slight elevation, however, of the gate will permit the ends of the bars to swing freely past the portions of the web. The roller construction of the portion 65 is convenient in that when a person takes hold of the

bars as for instance the bar 6 to raise the gate for the purpose of passing through it, by swinging it slightly upon its axis, any friction will be compensated for by such roller. In fact after he has raised the gate to a certain height by pressing upwardly and outwardly he will not have to change the direction of pushing when the gate reaches the position in which it will open. This movement is illustrated in the diagrammatic view of Fig. 10.

When the gate is being used to permit a person to pass through it, it is desirable that it should be moved on both of its axes, vertical and horizontal but when it is being raised to its full extent, it is desirable that it should not move upon its vertical axis. For this reason a latch 70 is carried by the hanger and its toe 71 is adapted to engage the notch 72 in the flange 15 of the post portion 10. A suitable spring 73 is provided for throwing this latch into engagement with the notch. An arm 74 is carried by the gate as for instance by the bar 6 for engaging the head 75 of the latch 70 and holding this out of its engaging position when the gate is raised sufficiently to permit it to clear the portions of the divided web but is so located that upon further movement upwardly the latch will be permitted to respond to its spring 73 and engage the notch.

The spring 73 may if desired be made sufficiently strong to act as a counter balance for partially supporting the weight of the gate when it is in its down position. A counter balance spring 76 is shown connected between an arm 77 upon the gate and some suitable connecting device upon the hanger.

It will be noticed that this gate may be lowered from either side. That when it is in a raised position the bars will lie closely together in a compact assemblage and may be caused to stand in perfectly vertical position so that although the dead centering of the operating wrist will lock the gate in its raised position yet the strain will largely be borne by substantially stationary parts of the device while the gate is in this vertical position.

Having thus described my invention, I claim:

1. The combination with a hanger embodying a downwardly directed vertically disposed pin, an engaging shoulder adjacent to the upper portion of the pin, and an upstanding portion provided with a pivot bearing, a gate having a pivot mounted in said pivot bearing and a support for the hanger having a vertically disposed bearing for the said pin, and a seat for the said shoulder.

2. The combination with a gate, of a horizontal pivot for supporting the gate, a pulley fast with the gate adjacent the pivot, a

vertically reciprocable member, a belt passing about the pulley and connected at opposite sides thereof to said member, a crank wrist, a connecting-rod connecting the crank wrist to the reciprocatory member, and means for revolving the crank-wrist.

3. The combination with a gate, of a horizontal pivot for supporting the gate, a pulley fast with the gate adjacent the pivot, a vertically reciprocable member, a belt passing about the pulley and connected at opposite sides thereof to said member, a crank-wrist, a connecting-rod connecting the crank-wrist to the reciprocatory member, means for revolving the crank-wrist, the set or timing of the crank-wrist being such that the dead center will be passed upon the gate assuming an open position, and means for stopping the crank-wrist upon its passing over the dead center.

4. The combination with a gate of a horizontal pivot therefor, a vertical pivot therefor, means for locking the gate from rotation upon the vertical pivot, and means for releasing the locking means to become effective upon a predetermined movement upon the horizontal pivot.

5. The combination with a gate, of a horizontal pivot therefor, a vertical pivot therefor, a lock for preventing the gate from swinging on its vertical pivot when down, and disengageable from the gate by raising the same a short distance, and means controlled by the gate upon being raised to a further height to release the lock.

6. The combination of a standard having a vertically disposed pivot seat, a hanger having a pivot located in the seat, a horizontally disposed pivot seat on the hanger, a pivot in such seat, a folding gate having a bar carried by such pivot, and means for rotating the said bar on said pivot.

7. The combination of a standard having a pivot seat, a hanger having a pivot located in the seat, and a horizontally disposed pivot seat, a pivot in such seat, a folding gate having a bar carried by such pivot, means for rotating the said bar on said pivot, a bar and means connecting the same to the pivot carried bar in parallelism but for movement relative thereto, said hanger having a slot, a pivot movable in the slot and carried by said second named bar, and a link connecting said pivot to the hanger.

8. The combination with a gate, of a horizontal

pivot for supporting the gate, a pulley fast with the gate adjacent the pivot, a vertically reciprocable member, a belt passing about the pulley and connected at opposite sides thereof to said member, means for adjusting the slack of the belt, a crank wrist, a connecting-rod connecting the crank wrist to the reciprocatory member, and means for revolving the crank-wrist.

9. A gate comprising a number of parallel bars, transverse bars pivoting these together, means for turning one of said parallel bars about an axis, and a link pivoted to a portion of the gate and to a support for restraining the other bars from movement upon such axis.

10. A gate comprising a number of parallel bars, transverse bars pivotally connected thereto, an axial pivot for one of the parallel bars, a support for the axial pivot, the support being provided with a guideway, means carried by another of said parallel bars for traversing said guideway, a link pivoted to the support and to said second named parallel bar for cooperation with the guideway in causing the bars to fold together when said first named parallel bar is turned about said axial pivot.

11. A gate comprising a number of parallel bars, transverse bars pivotally connected thereto, an axial pivot for one of the parallel bars, a support for the axial pivot, the support being provided with a guideway below and in front of the axial pivot, means carried by another of said parallel bars for traversing said guideway, a link pivoted to the support below and to the rear of the axial pivot and to said second named parallel bar for cooperation with the guideway in causing the bars to fold together when said first named parallel bar is turned about said axial pivot.

12. A gate comprising a number of parallel bars, transverse bars pivotally connected thereto, an axial pivot for one of the parallel bars, a support for the axial pivot, a link pivoted to the support below and to the rear of the axial pivot and to another of said parallel bars for causing the bars to fold together when said first named parallel bar is turned about said axial pivot.

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