

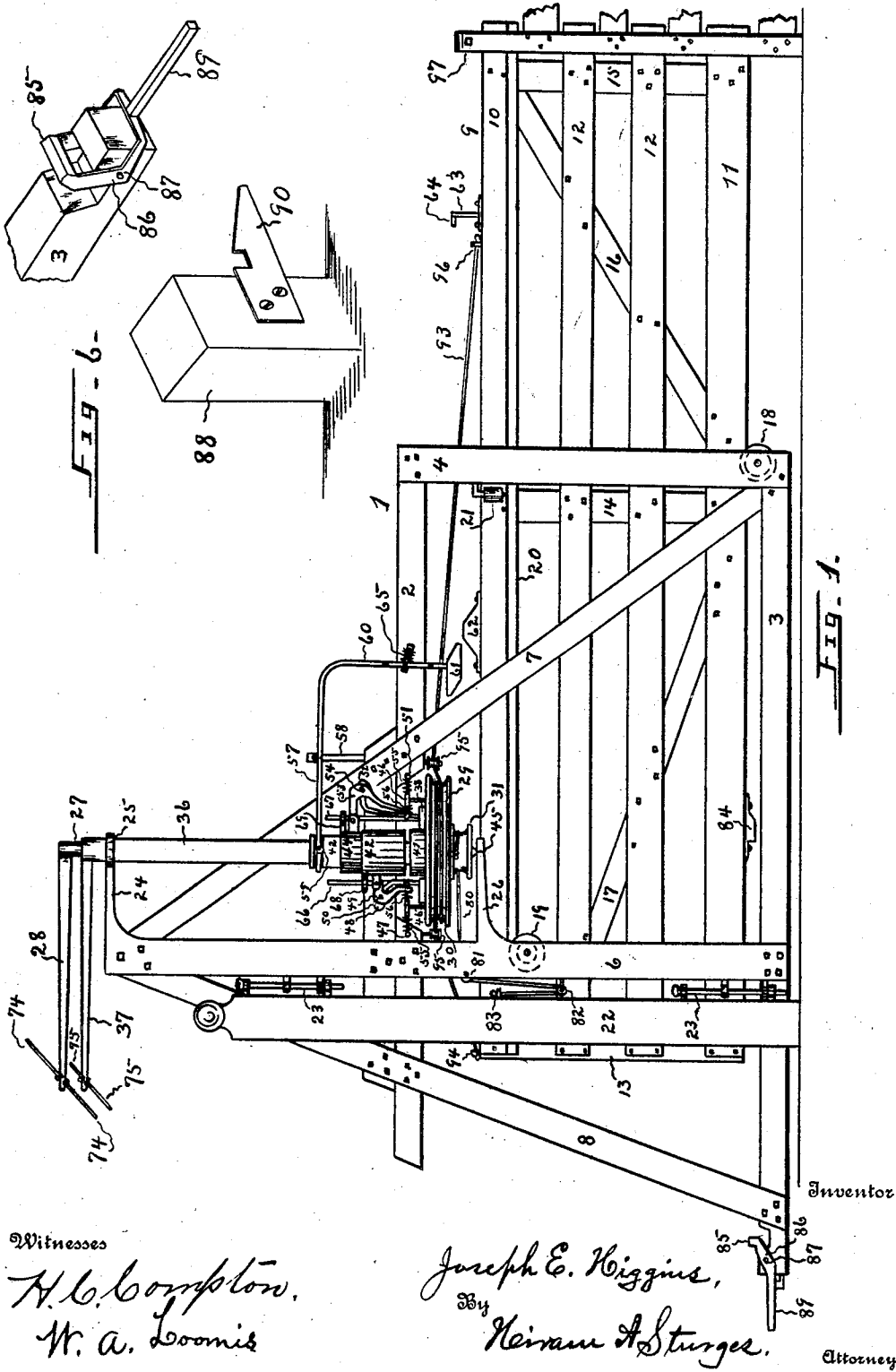
No. 896,016.

J. E. HIGGINS,  
GATE.

PATENTED AUG. 11, 1908.

APPLICATION FILED FEB. 27, 1908.

4 SHEETS—SHEET 1.



Witnesses

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4 SHEETS—SHEET 2.

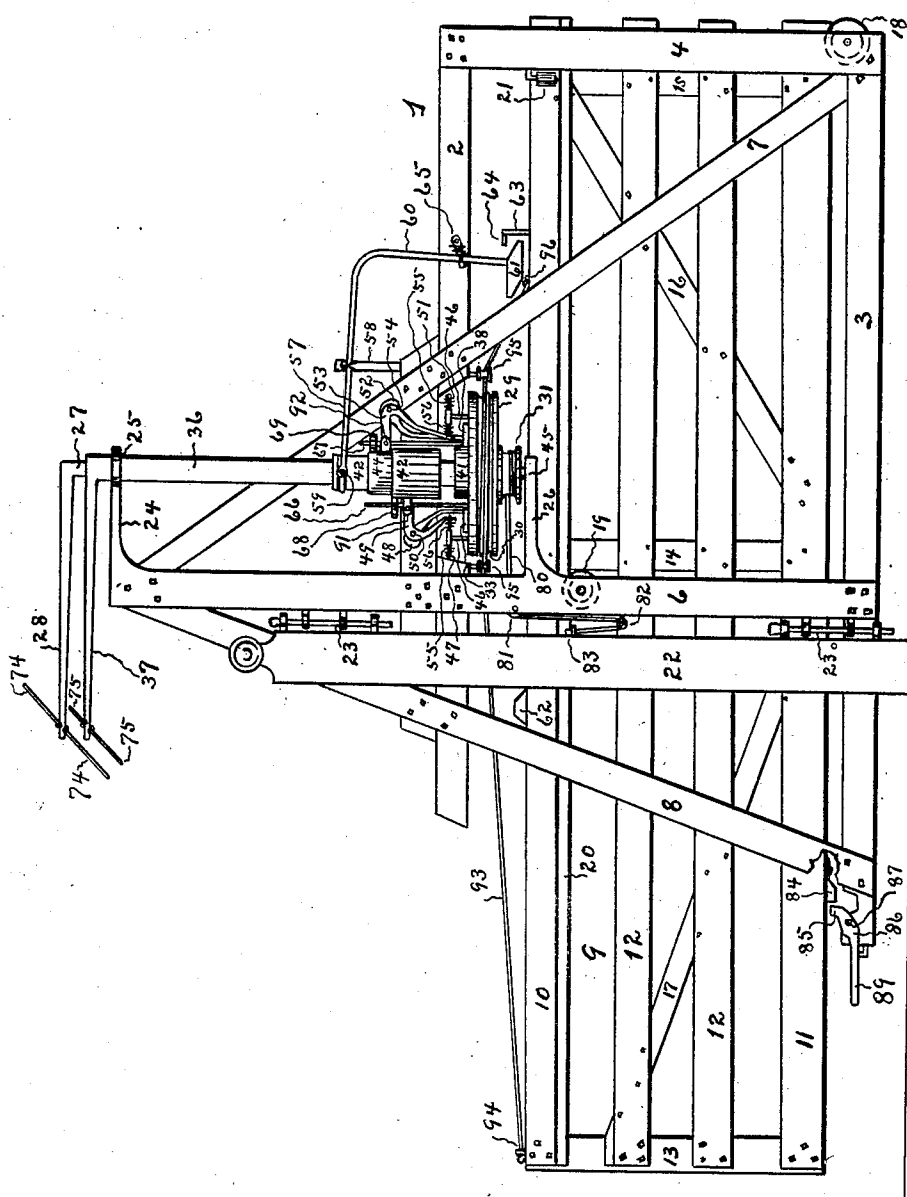


FIG. 2.

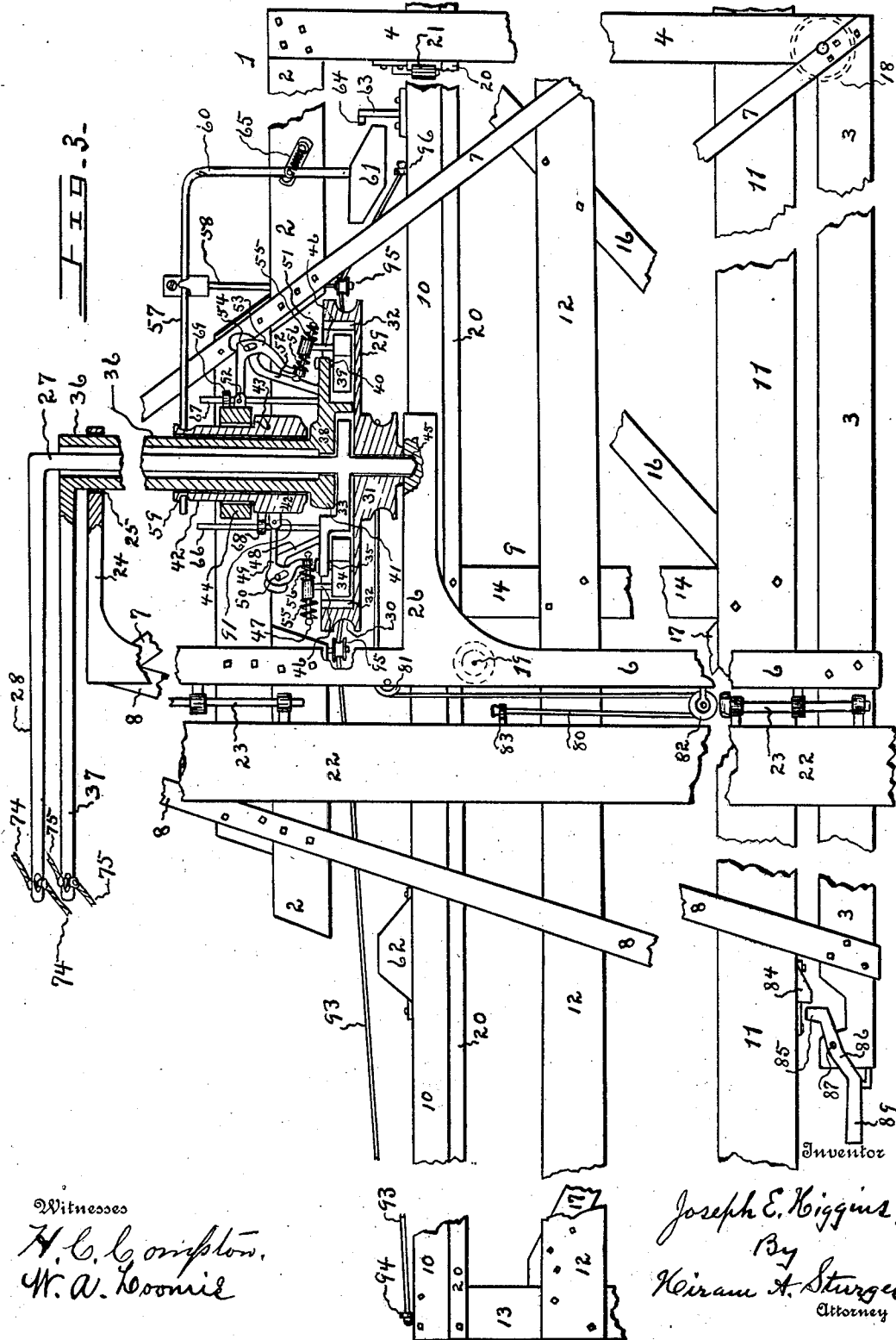
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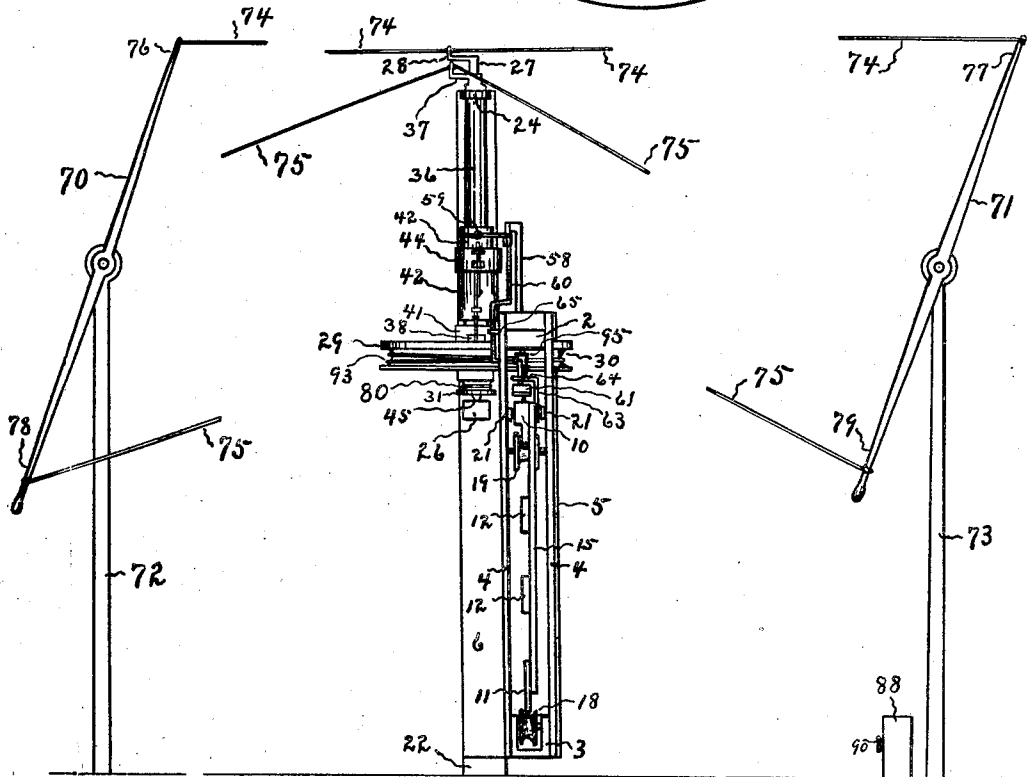
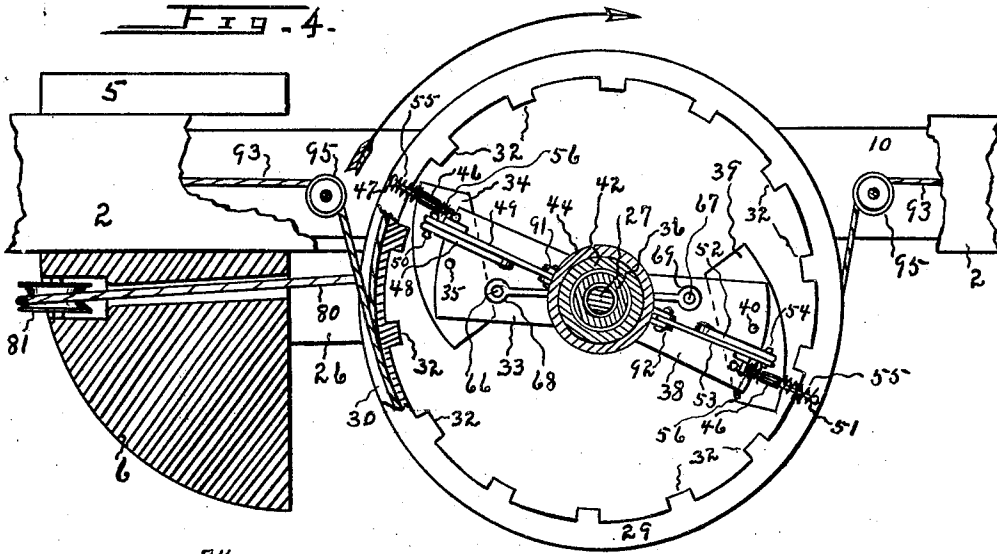
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4 SHEETS—SHEET 4.



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# UNITED STATES PATENT OFFICE.

JOSEPH E. HIGGINS, OF NORTH LOUP, NEBRASKA.

## GATE.

No. 896,016.

Specification of Letters Patent.

Patented Aug. 11, 1908.

Application filed February 27, 1908. Serial No. 418,029.

*To all whom it may concern:*

Be it known that I, JOSEPH E. HIGGINS, a citizen of the United States, residing at North Loup, in the county of Valley and State of Nebraska, have invented certain new and useful Improvements in Gates, of which the following is a specification.

This invention relates to improvements in gates of the class more particularly for use upon farm or yard fences, and has for its object the provision of operating means for opening and closing the gate by a person while driving, without being obliged to leave the team and without dismounting from the vehicle.

The invention includes features of construction for telescoping the gate-frames, and for securing the gate in an opened or closed position, all to be conveniently operated while upon the vehicle.

The invention consists of the combination and arrangement of parts as described herein, pointed out by the claims and illustrated by the accompanying drawing, wherein,—

Figure 1 is a side view of the gate when closed. Fig. 2 is a side view of the gate with the inner frame drawn to the rear, a part of the outer frame being broken away. Fig. 3 is a broken, side view of the gate, somewhat enlarged and partly in section, to clearly show details of construction. Fig. 4 is an enlarged, plan view of the windlass, partly broken away and partly in section. Fig. 5 is a front end view of the gate, also showing mounted hand-levers, for use in opening or closing, the wire connections being broken away. Fig. 6 is a perspective view of the anchor-post and part of lower gate-rail, to illustrate means for securing the gate in an opened position.

Referring now to the drawing for a more particular description, numeral 1 indicates an outer gate-frame comprising the upper and lower horizontal rails 2 and 3, rigidly secured between the transverse, front end-pieces 4 and transverse, oppositely-disposed rear-plates 5 and 6. Rear-plate 6 of the outer frame is extended above the upper horizontal rail, and to its upper end are secured diagonal braces 7 and 8, the lower ends of these braces being secured, respectively, to the front and rear ends of the lower, horizontal rail 3.

I construct an inner, rectangularly-formed,

gate-frame 9, consisting of the upper and lower horizontal strips or rails 10 and 11, the intermediate horizontal strips 12, all being rigidly secured to the transverse plates 13, 14 and 15, the structure being reinforced by the inclined braces 16 and 17.

The inner frame is vertically seated between the transverse end-pieces 4 and between transverse plates 5 and 6 of the outer frame, and is supported upon rollers 18 and 19. Roller 18 is located between and at the lower ends of end-pieces 4 of the outer frame, and is formed with a circumferential groove within which the lower horizontal strip 11 of the inner frame may travel.

The upper horizontal rail or strip 10 of the inner frame is provided with a tongue 20, extending along its lower side. Roller 19 is mounted between rear-plates 5 and 6, and is provided with a circumferential groove, within which tongue 20 may travel, and this roller is mounted at a sufficient height so that the strips or rails of the inner frame will be maintained substantially parallel with the upper and lower rails of the outer frame during the rearward or forward movements of the inner frame. I also employ oppositely-disposed rollers 21, mounted near the upper terminals of end-pieces 4 of the outer frames; these rollers make contact with the sides of upper rail 10 of the inner frame to lessen friction, and to prevent contact of said rail 10 with end-pieces 4, during the endwise movements of the inner frame. As thus constructed and assembled, the outer and inner frames may have a light weight, but being strongly braced, will sustain the severe stresses and strains usual to these structures, and will be durable in wear, and the inner frame may be readily moved, longitudinally, very slight force being required, for this purpose. A gate post is indicated at 22, and the outer frame is hung thereon by means of hinges 23 mounted upon rear plates 6, so that the gate may swing substantially 90 degrees. The front ends of strips or rails 10, 11 and 12 of the inner frame are extended to the front of the transverse plate 15, so that they may pass between gate-posts 97, when the gate is closed.

For the purpose of opening and closing the gate and for otherwise controlling its movements, I employ devices now to be described. Upon the top of rear plate 6 is provided

the transverse arm 24, apertured at 25; I provide the supporting-arm 26 upon plate 6, disposed transversely thereon, adjacent the upper rail 10 of the inner frame. I provide  
5 the vertical shaft 27, seated in sleeve 36, and having its lower end journaled at 45 in arm 26, its upper end provided with the transverse operating arm 28.

I provide the horizontally disposed windlass 29, having the circumferential groove 30, and having the pulley 31 secured or formed centrally upon its base, the pulley resting upon arm 26, the windlass and pulley having pivotal mountings upon the lower end of  
10 shaft 27; and the windlass is provided with inwardly projecting gear teeth 32. Secured or formed upon shaft 27 is the transverse plate or arm 33 which extends in the direction of teeth 32 to furnish a pivotal mounting  
15 for a gear-engaging shoe 34, by use of the pin or pivot 35.

I provide the sleeve 36, which encircles shaft 27, and has a bearing in aperture 25 of arm 24, and is provided at its upper end with  
25 the transverse operating arm 37; the sleeve rests upon plate 33 and upon windlass 29, and is provided with a transverse plate or arm 38, which extends in the direction of teeth 32 to furnish a pivotal mounting for a  
30 second gear-engaging shoe 39, by means of pin 40. As thus constructed, shoes 34 and 39 may swing, so that the front or rear ends of said shoes may be disposed adjacent teeth 32 to alternately engage these teeth; means  
35 for swinging these shoes for engagement with the teeth, will presently be explained. Shoes 34 and 39 are similar in form; they have flat upper and lower surfaces; their sides adjacent teeth 32 are outwardly curved  
40 and have a greater length than the opposite sides, thereby providing projecting outer edges which may readily engage teeth 32.

Sleeve 36 is provided with an enlargement 41 at its lower terminal, upon which is seated  
45 a second sleeve 42, having an annular enlargement 43 formed upon its lower end, and upon this enlargement is seated collar 44. As thus described a movement of operating arm 28, in either direction, will actuate shaft 27;  
50 and shoe 34 will thereby be moved circularly along the upper surface of windlass 29; and sleeve 36 may be actuated by a movement of operating arm 37, which will cause shoe 39 to be moved circularly.

In order to control the pivotal movements of shoes 34 and 39 so that their ends may, alternately, be made to engage teeth 32, I employ devices now to be described. At the  
60 front ends, so-called for convenience, of each of these shoes is secured an upwardly-extending arm 46; within the upper, enlarged terminals of these arms are transversely seated the sliding-pins 47 and 51. Upon plate 33 is secured the standard 48, and upon

sleeve 42 is pivotally mounted, at 91, the inner end of the outwardly-extending rock-lever 49, having a pivotal mounting between its ends, at 50, upon the upper end of standard 48; its lower end having a pivotal  
65 connection with the inner end of the slidable pin 47.

Upon plate 38 is secured the standard 52, and upon collar 44 is pivotally mounted, at 92, the outwardly-extending rock-lever 53, having a pivotal mounting between its ends,  
75 at 54, upon the upper end of standard 52, its lower end having a pivotal connection with the inner end of the slidable pin 51. Each of the ends of pins 47 and 51 are resiliently mounted, by means of springs 55 disposed on  
80 these pins outwardly of arms 46, and springs 56 disposed inwardly of said arms 46. As thus described, rock-levers 49 and 53 may operate to control the pivotal movements of shoes 34 and 39. If sleeve 42 is given a limited  
85 upward sliding movement upon sleeve 36, the inner end of rock-lever 49 will be moved upward, causing pin 47 to be drawn inwardly through the enlarged, upper end of  
90 arm 46, thereby causing the end of shoe 34 upon which its arm 46 is located to move inwardly, and causing the opposite end of this shoe to engage teeth 32.

The upward movement of sleeve 42, just described, will elevate collar 44, since it  
95 rests upon flange 43; an upward movement of collar 44 will elevate the inner end of rock-lever 53, and will swing shoe 39, so that its rear end will also engage teeth 32; and if sleeve 42 and collar 44 are afterwards lowered,  
100 shoes 34 and 39 will have oppositely swinging movements to that just described, since the lower ends of rock-levers 49 and 53 will move outwardly. It is therefore seen that shoes 34 and 39 may be made to alternately engage teeth 32 of the windlass; that,  
105 when the front end of shoe 34 swings outward to make this engagement, the front end of shoe 39 also swings outward to a similar engagement; and when the rear end of shoe 34  
110 swings outward, the rear end of shoe 39 also swings outward.

In order to elevate sleeve 42, I employ lever 57, fulcrumed near its middle upon standard 58, this standard being supported  
115 upon the outer frame. One end of lever 57 is connected, at 59, with sleeve 42, the opposite end 60, being bent downward, and upon its terminal between the upper rails of the outer and inner frame, is secured the  
120 pointed contact-shoe 61.

I employ the cable or wire 93, having one of its terminals secured, at 94, upon and near the rear end of rail 10 of the inner frame, its opposite end being secured, at 96, upon and  
125 near the front end of said rail; adjacent the periphery of windlass 29, I employ pulleys 95 secured upon the outer frame, and thereby

cable 93 will be sustained in alinement with the windlass. This cable is wound upon and frictionally engages the windlass so that its rotation will cause a lengthwise movement of the inner gate-frame and will swing the gate, as hereinafter more particularly described, and in the present instance, cable 93, after leaving pulleys 95, passes to the front of the windlass, as clearly shown in Fig. 4.

Secured upon and to project above the upper rail 10 of the inner frame, near the rear end of this rail is contact-lug 62, and secured upon and near the front end of said rail is the upright arm 63, having the transverse finger 64, and, as will be seen, finger 64 will make contact with the upper surface of shoe 61 to cause end 60 of lever 57 to move downward during a rearward movement of the inner gate-frame; and a forward movement of the inner gate-frame will cause lug 62 to make contact with the lower surface of shoe 61, and thereby raise said shoe and the end-portion 60 of lever 57.

According to the described construction, when sleeve 42 and collar 44 are elevated, the rear ends of shoes 34 and 39 are moved within contacting range of teeth 32 of the windlass, and will continue in range of these teeth so long as sleeve 42 and the collar remain elevated, and at this time springs 55 are compressed.

Collar 44 will move downward from gravity, when sleeve 42 is lowered, and a downward movement of said sleeve and collar will cause the front ends of these shoes to move within contacting range of teeth 32 where they will remain so long as the sleeve and collar are in a lowered position, and at this time springs 56 are compressed.

In order that sleeve 42 and collar 44 may remain reliably in a raised or lowered position until such time as they are forcibly moved in an opposite direction, I employ the spring latch 65, mounted upon rail 2 of the outer frame and connected with arm 60, and when shoe 61 is lowered, the operation of latch 65 will cause said shoe and arm 60 to remain lowered until the shoe makes contact with lug 62.

As the operation of spring latch 65 may not be fully understood, it is explained that one end of this latch is pivotally mounted upon rail 2, its opposite end being provided with a longitudinal slot which is engaged by a pin mounted upon arm 60. This pin is engaged by a strong spring mounted in the slot of the latch. One end of the latch may swing or follow the movement of arm 60, to cause this arm and shoe 61 to remain in a raised or a lowered position, until said shoe and arm are forced in an opposite direction.

In order that sleeve 42 and collar 44 may have a swinging movement in common with, respectively, plates 33 and 38, I employ the

vertical alining-rods 66 and 67 secured respectively upon plates 33 and 38 and which traverse, respectively, eye-bolts 68 and 69; eye-bolt 68 extends outwardly from sleeve 42, and eye-bolt 69 extends outwardly from collar 44, and on account of this construction rock-levers 49 and 53 may have smooth movements upon their bearings.

I provide hand-levers 70 and 71, pivotally mounted midway of their ends, upon posts 72 and 73, these posts being set in the ground, upon opposite sides and transversely of the gate way, and employ flexible strands, as wires 74 and 75. Wire 74 has its ends connected to ends 76 and 77, respectively, of hand-levers 70 and 71, and is secured at its middle, upon operating-lever 28. Wire 75 has its ends connected to ends 78 and 79, respectively, of hand-levers 70 and 71, and is secured at its middle upon operating lever 37, and in practice, either of these levers may be used for opening or closing the gate. If the lower end of hand-lever 70 is moved in the direction of the gate, operating-lever 28 will swing toward post 72, and operating-lever 37 will swing toward post 73, since the wires are connected as described; and movements opposite to that described, imparted to the lower end of lever 70 will cause reverse swinging movements of operating-levers 28 and 37, whereby shoes 34 and 39 are operated to cause a rotation of windlass 29.

It is sometimes desirable that the gate be raised a few inches, so that it may swing clear of snow or other obstructions, and therefore I employ cable 80, having one terminal secured to pulley 31; this cable passes outward horizontally over pulley 81 and then passes downward to bear upon pulley 82, both of these pulleys being secured upon rear plate 6 of the outer frame; the cable then passes upward, and its opposite terminal is secured at 83 upon the gate post; when windlass 29 is rotated in the direction indicated by the arrow in Fig. 4, cable 80 will be wound upon pulley 31, thereby causing the gate to be elevated; and the gate will be lowered when the windlass has a rotation in the opposite direction.

To open the gate, the operator, by alternate forward and backward movements imparted to either of hand-levers 70 or 71, will cause a rearward movement of the inner frame, and the gate will also be gradually elevated a few inches. This rearward movement will be continued until lug 84, which is secured upon and near the rear of the lower horizontal strip 11 of the inner frame, makes contact with the projection 85 of latch 86, this latch being pivotally mounted, at 87, upon the rear terminal of the lower, horizontal rail of the outer frame; at this time the inner frame has not completed an entire

rearward movement, and finger 64 of arm 63 has not engaged shoe 61; it will be noted that, at this time, the front ends of the shoes, or the ends upon which arms 46 are located, are in engagement with teeth 32 of the windlass, as shown in Fig. 4. The further rearward movement of the inner frame being prevented by a contact of lug 84 with the upward projection of latch 86, the operator, by continuing the actuation of the hand-lever, as described, will cause the gate to swing, the front end moving toward post 72. The rear end of the gate will swing adjacent anchor-post 88, situated substantially at a right angle to the gate way, and finger 89 of the latch will slide upon and become engaged by the keeper 90, secured upon the anchor-post. When finger 89 is raised by the upward sliding movement on keeper 90, projection 85 is lowered, and thereby the inner frame may have a further, rearward movement. The operator then, by further actuation of the hand-lever, completes the rearward movement of the inner frame, and thereby causes finger 64 to engage shoe 61. When finger 64 engages shoe 61, said shoe is pushed downward and is held by spring-latch 65 as already explained, and the lowering of shoe 61 causes sleeve 42 and collar 44 to be raised, and, as already explained, causes the rear ends of shoes 34 and 39 to be thrown outward and to pass into engagement with teeth 32 of the windlass.

The gate will remain secured in an opened position by means of the finger of latch 86 engaging keeper 90 until the operator proceeds to close the gate, and this is accomplished by moving either of the hand-levers 70 or 71 back and forth in the manner described. Since shoe 61 has been secured by spring-latch 65, in a lowered position, windlass 29 will be rotated in a direction opposite to that heretofore mentioned, and the inner gate will move forwardly. As soon as it has moved a few inches in a forward direction, lug 84, upon the lower rail of the inner frame, passes over and depresses projection 85 of latch 86, which operation lifts finger 89 from keeper 90. Since the weight of the gate is sustained upon cable 80, gravity will cause the gate to swing in a direction away from anchor-post 88, as soon as latch 86 leaves keeper 90, and, while swinging, the gate will be gradually lowered. Lug 62 is so disposed upon the upper side of rail 10 that it will engage shoe 61 and will elevate it at the time the gate is closed; and at the time the gate is closed, the projecting front ends of strips 11 and 12 of the inner frame pass between gate-posts 97, whereby the gate is secured in a closed position. It will thus be seen that finger 64 upon the upper rail of the inner frame is for the purpose of engaging shoe 61, just before the inner frame has had a com-

plete rear movement, for the purpose of causing the rear ends of shoes 34 to engage the teeth of windlass 29, that the gate may thereafter be closed; and lug 62 is for the purpose of engaging and raising shoe 61 at the time the inner frame has entered between the double posts 97, so that the front ends of shoes 34 will thereafter engage the teeth of the windlass, that the gate may thereafter be opened.

While I have fully described the several parts and their operation, I do not limit myself thereby; it is considered that many details of construction could be changed or omitted without departing from the invention, the scope thereof being determined by the claims.

What I claim as my invention, is,—

1. In a gate, the combination with a stationary part, a first gate-frame pivotally supported upon the stationary part, a second gate-frame supported by said first gate-frame, a rotatable shaft mounted upon said first gate-frame; a rotatable sleeve mounted on the rotatable shaft; a windlass mounted upon said rotatable shaft; a flexible member engaging said windlass, said flexible member extended longitudinally of and having terminals secured upon said second gate-frame; means upon the rotatable shaft and rotatable sleeve in communication with the windlass to actuate said windlass during the movements of said rotatable shaft and rotatable sleeve.

2. In a gate, the combination with a stationary part, an outer frame hinged upon the stationary part, an inner rectangular frame seated within the outer frame; a vertical, rotatable shaft supported upon the outer frame; a rotatable sleeve mounted upon the vertical, rotatable shaft; a windlass pivotally mounted upon the vertical, rotatable shaft; a flexible strand engaging said windlass, said flexible strand extended longitudinally of and having oppositely-disposed terminals secured upon the inner rectangular frame; means upon said vertical, rotatable shaft and rotatable sleeve in communication with and to actuate said windlass during the movements of said vertical, rotatable shaft and rotatable sleeve.

3. In a gate, the combination with a stationary part, an outer frame hinged upon the stationary part, an inner rectangular frame seated within the outer frame; a vertical, rotatable shaft supported upon the outer frame; a rotatable sleeve mounted upon the vertical, rotatable shaft; a windlass pivotally mounted upon the vertical, rotatable shaft and having an adjacently-disposed pulley secured thereon; a first flexible strand; a second flexible strand; said first flexible strand in engagement with said windlass and disposed longitudinally of and having oppositely-disposed terminals secured upon the

inner rectangular frame; said second flexible strand secured upon said stationary part and in engagement with said adjacently-disposed pulley of said windlass; means upon said vertical, rotatable shaft and rotatable sleeve in communication with and to actuate said windlass and to actuate the adjacently-disposed pulley upon said windlass during the

movements of said vertical, rotatable shaft and rotatable sleeve.

In testimony whereof I have affixed my signature in presence of two witnesses.

JOSEPH E. HIGGINS.

Witnesses:

JOHN MANCHESTER,

T. MURRIE RICH.

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