No. 658,228. Patented Sept. 18, 1900.

J. F. BARNES.

GATE.

(Application filed June 6, 1900.)

(No Model.) 2 Sheets—Sheet 1.

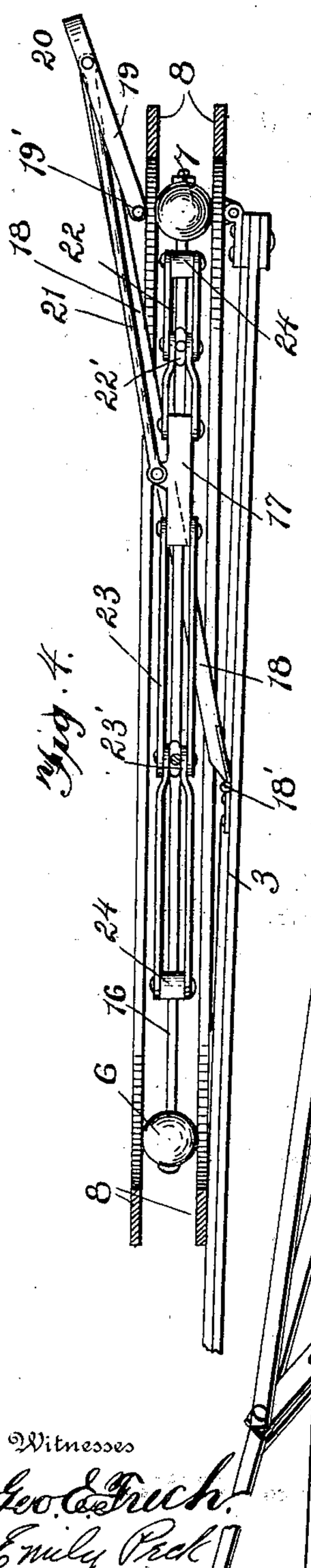

Fig. 4.

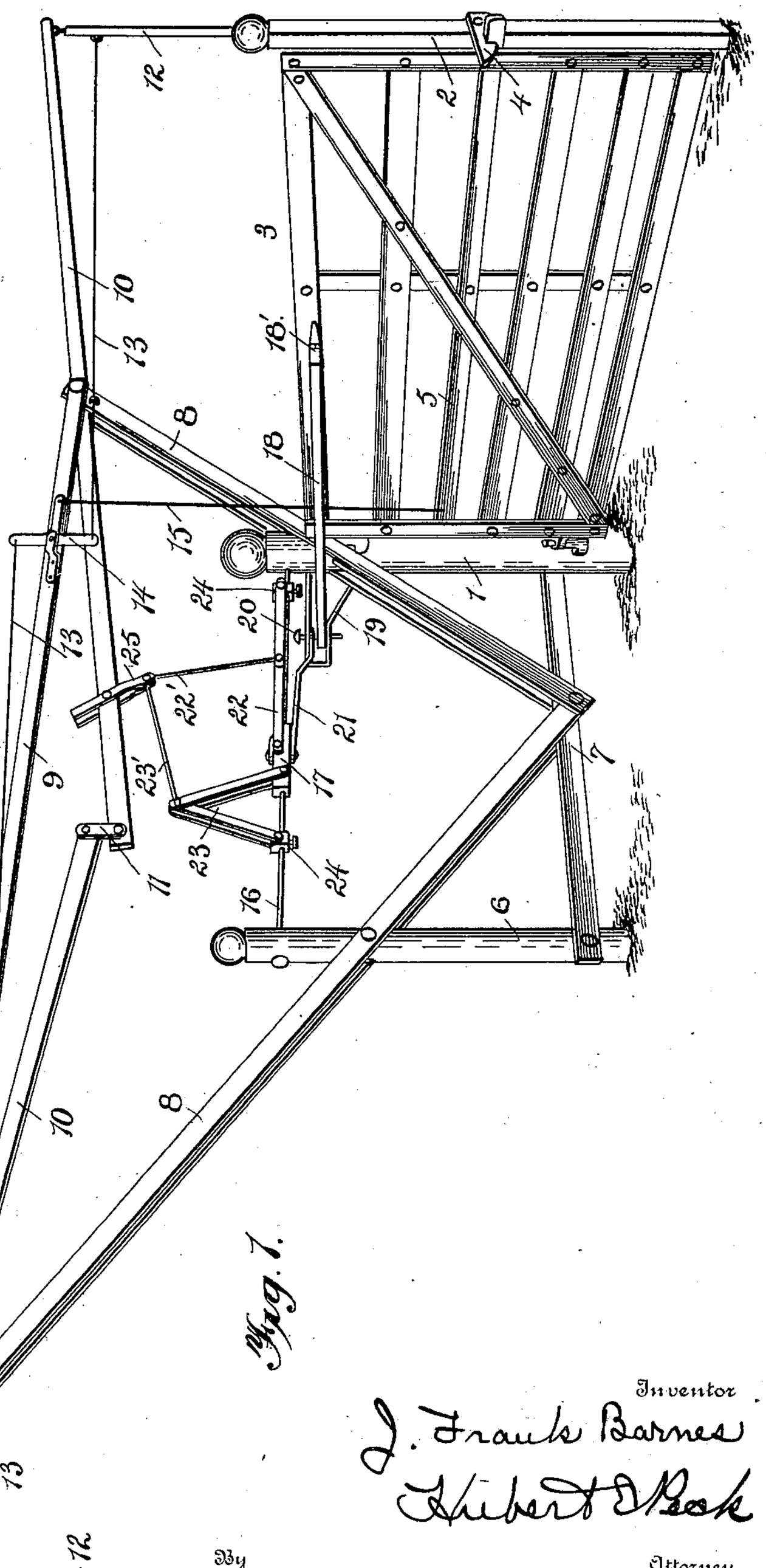

Fig. 1.

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Fig. 2.

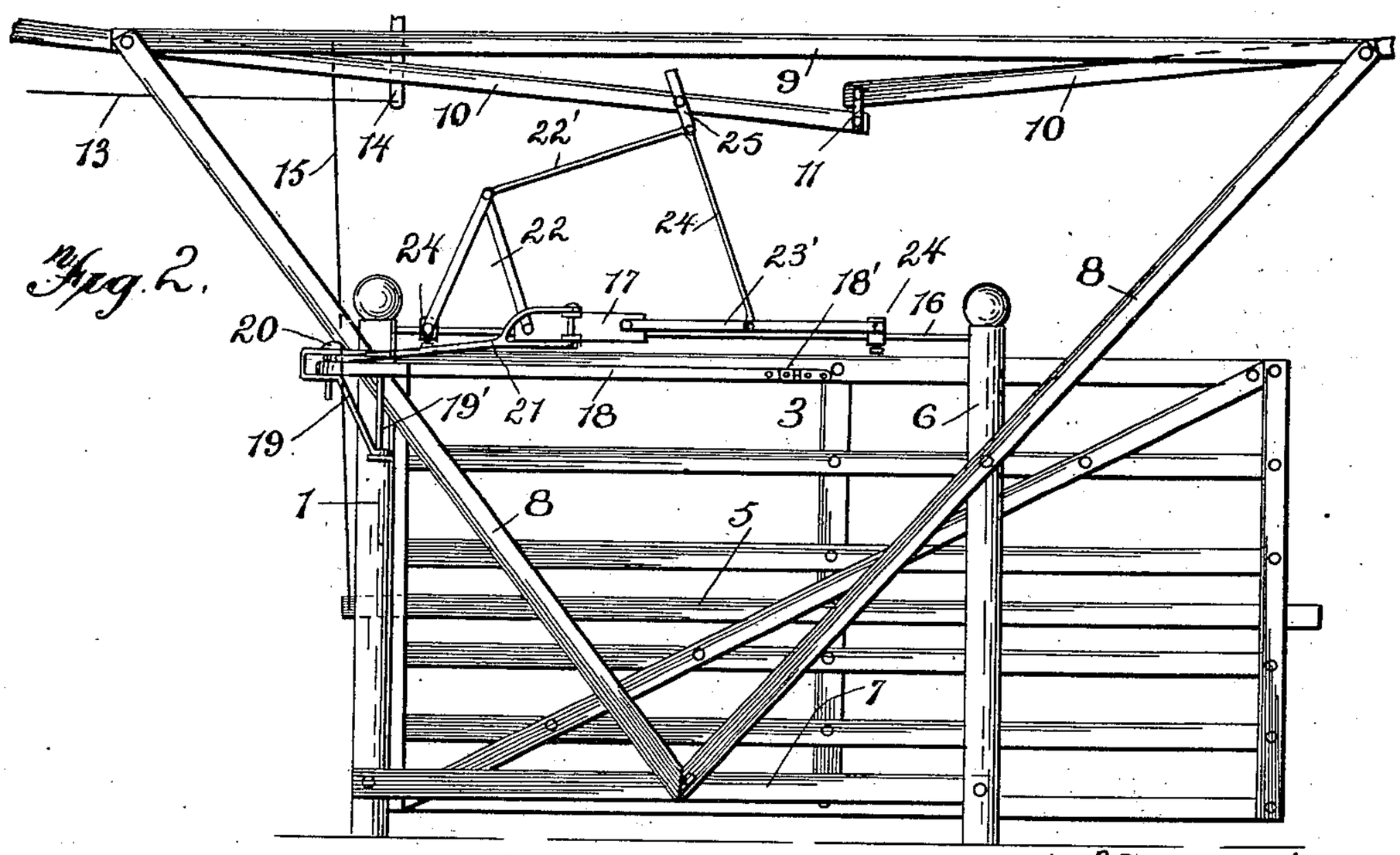

Fig. 3.

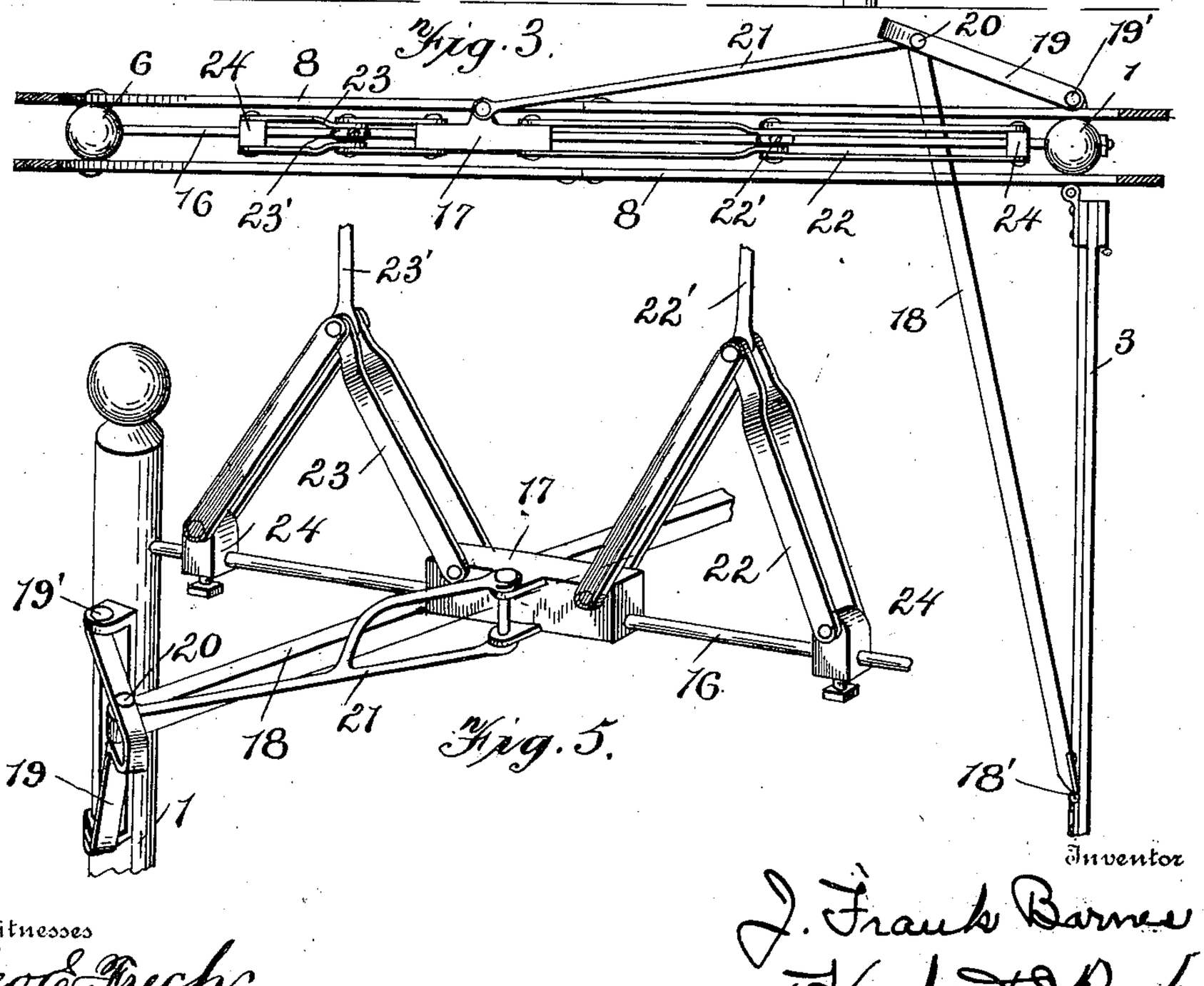

Fig. 5.

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JOSHUA FRANK BARNES, OF SHANNON, ILLINOIS.

GATE.

SPECIFICATION forming part of Letters Patent No. 658,228, dated September 18, 1900.

Application filed June 6, 1900. Serial No. 19,276. (No model.)

To all whom it may concern:

Be it known that I, JOSHUA FRANK BARNES, a citizen of the United States, residing at Shannon, county of Carroll, State of Illinois, have invented certain new and useful Improvements in Gates; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain improvements in gate-operating mechanisms, and more particularly involves lever mechanisms for opening and closing gates; and the objects and nature of my invention will be readily understood by those skilled in the art from the following explanation of the construction, shown in the accompanying drawings merely as an example for the purposes of explanation, of a construction within the spirit and scope of my invention.

The invention consists in certain novel features in construction and in combinations and in arrangements of parts and details, as more fully and particularly pointed out and specified hereinafter.

Referring to the accompanying drawings, Figure 1 is a perspective view of a swinging gate provided with opening and closing devices constructed in accordance with my invention, the gate being shown closed. Fig. 2 is an elevation, parts being broken away, showing the gate open. Fig. 3 is an enlarged top plan view of the gate-operating mechanism, the gate being closed, a portion of the gate and the upper portion of the sweep-supporting frame being broken away. Fig. 4 is a view showing the parts in the positions they assume when the gate is opened. Fig. 5 is a detail perspective view of the gate-post, the gate opening and closing toggle, the slide and the two operating-toggles therefor, parts being broken away, the toggles and operative parts shown at intermediate points in their strokes.

In the drawings, 1 and 2 are the gate-posts, arranged on opposite sides of the roadway and at opposite ends of the gate when closed.

3 is a horizontal swinging gate of any suitable and desirable construction which is hung at one end by hinges of any suitable and desirable construction to the gate-post 1, so that the free end of the post swings to or closes against the opposite post 2. This post 2, if desirable, can be provided with a horizontal laterally-projecting rigid catch 4, usually having its shoulder and beveled edge at its under surface.

I usually provide the gate with a long horizontally-disposed latch or lever 5, arranged longitudinally thereof and fulcrumed at a point between its ends to swing in a vertical plane. The outer end of the latch is projected beyond the free end of the gate to pass under the catch 4 and catch behind the shoulder thereof. Hence animals cannot release the latch by lifting the gate or rubbing against the same. The latch is released from the catch by raising its rear end, as hereinafter set forth.

6 is another post arranged beside the roadway and a distance from the gate-post 1. The gate when opened swings to or about to said post 6. These two posts usually carry the supporting-framework for the operating-sweeps and also sustain and support the gate opening and closing mechanism.

7 is a beam or sill rigidly secured to and arranged horizontally between the lower portions of the two posts 1 and 6. 8 8 are two pairs of long beams rigidly secured at their lower ends to said sill 7 at a suitable point between the two posts. If desirable, the beams 8 can all be secured to said sill by a single long bolt. Said pairs of beams 8 extend upwardly and outwardly in different directions to the desired elevation and have their upper ends rigidly connected by the pair of long horizontal beams 9 9, thus forming a triangular frame. The pairs of beams 8 cross and are rigidly secured to the posts 1 6, respectively, and extend a considerable distance outwardly and upwardly beyond said posts. The two vertically-swinging and oppositely-extending sweeps 10 10 are fulcrumed at intermediate points in their lengths at the upper outer corners or angles, respectively, of said elevated vertically-disposed supporting-frame. One sweep extends from the gate in one direction beside the roadway, and the other sweep extends from the gate in the opposite direction along the roadway. The inner ends of the sweeps usually (although not necessarily) overlap and are piv-

otally connected together by links or loops 11, so that said sweeps will move vertically together. The outer end of each sweep is shown provided with a depending pull-handle 12, loosely coupled at its upper end to the outer end of the sweep, so that said handle can swing laterally independently of the sweep. Pull connections 13 are attached to the pull-handles and extend inwardly and are connected to the upper and lower vertical arms, respectively, of a vertically-rocking three-armed lever 14, fulcrumed to the upper horizontal portion of said upright supporting-frame. 15 is a pull connection from the horizontal arm of said lever, extending downwardly and attached to the rear end of said latch carried by the gate. It will thus be noted that by swinging either one of said pull-handles in a direction away from the gate said three-armed lever will be rocked and raise the inner end of the latch and depress the outer end thereof free of the catch, so that the gate can be opened.

16 is a rigid horizontal rod extending between and rigidly secured to the two posts 1 6. 17 is a slide block or head mounted on said rod to slide thereon longitudinally. If desired, the rod can extend loosely and longitudinally through a longitudinal hole or passage in said block; but of course I do not wish to limit my invention to such specific arrangement or construction.

A gate-swinging toggle is coupled loosely to the gate and to a rigid support—such, for instance, as the gate-post 1. In the specific example illustrated this toggle swings in a horizontal plane and consists of the long lever, member, or link 18, suitably hinged at 18′ to the gate at a point between the ends of the gate. Said link 18 extends from its hinged connection with the gate in a direction generally toward and past the gate-post 1 or between the two posts 1 and 6 and at its outer end (the end opposite hinged end 18′) is pivotally coupled to the outer end of the short link, lever, or member 19 of the toggle. Said link 19, as shown, consists of a metal bracket or loop, into the outer closed end of which the link 18 extends and is loosely coupled by the vertical bolt or pin 20. The inner ends of this bracket or loop are spread and located a distance apart and in the same vertical plane and suitably hinged at 19′ 19′ to the gate-post 1, usually at the side thereof opposite the side at which the gate is hinged to said post. It will thus be observed that the joint of the toggle 18 19 is formed or effected by the vertical bolt, pin, or pivot 20.

21 is a rigid link at one end loosely coupled to the sliding head 17 and at its opposite end loosely coupled to the toggle 18 19, said link being usually loosely coupled to said toggle at its joint by having the pin 20 passed loosely through its end. It will thus be observed that when the gate is closed movement of the sliding head on the guide-rod toward the post 1 will through the medium of link 21 swing the toggle members in a direction to move the joint thereof rearwardly or outwardly between the two posts 1 6, and hence pull the gate open to its limit of opening movement against the supporting-frame. Then when the sliding head is moved in the opposite direction and toward gate-post 6 the toggle will be moved toward the gate and the gate will be swung closed and against gate-post 2.

Suitable mechanism is provided to reciprocate the sliding head and to lock the same at its opposite limits of movement to hold the gate either closed or open, and said mechanism is operatively interposed between said head and the sweeps, or, in other words, operative connections are interposed between said sweeps and said toggle. As an example of devices adapted for this purpose and within the spirit and scope of my invention, I show two sets of vertically-movable toggles 22 23, arranged in opposition to alternately break and straighten as the sliding head reciprocates back and forth. Each toggle of the two sets 22 23 consists of links joined together at their inner ends by a horizontal pivot. One end of the toggle is pivotally coupled to the head by one or more horizontal pivots, and the opposite end of the toggle is pivotally coupled by a horizontal pivot to a block or collar 24, rigidly secured on the guide-rod near an end thereof and adjustable thereon. These toggles are arranged above said guide-rod and when straightened out approximately rest on and parallel with said rod, and when broken or doubled up they project upwardly in inverted-V shape from said rod.

The toggle 22 extends from the end of the guide-rod near the gate-post to the sliding head and performs the function of drawing said head to open the gate, and when the gate is closed said toggle 22 is straightened out, usually beyond its dead-center, and performs the function of holding the gate locked against unauthorized opening and will not permit the gate to open until it (the toggle) is broken or its joint started on the upward course.

The toggle 23 extends from the sliding head toward the post 6 and is straightened out and practically locked down against the guide-rod when the gate is open, and thus holds the gate in its opened position and against suddenly swinging closed while vehicles or persons are passing through the gateway. This toggle 23 performs the function of closing the gate.

When one toggle 22 or 23 is straightened out and locked down against the guide-rod, the other toggle is at its limit of movement in the opposite direction—viz., is in its upwardly-doubled or broken position. Suitable means are provided to alternately break and straighten out these toggles. For instance, I show a pull-link 22′, loosely coupled to toggle 22, usually at its joint, and extended upwardly and pivotally joined to a swinging loop or bracket 25, pivotally and adjustably coupled to one of the sweeps. A correspond-

ing pull-link 23′ is correspondingly and loosely coupled to the toggle 23 at its joint and extended upwardly and also pivotally joined to the sweeps through the medium of said loose hanger or loop 25. It will thus be observed that as a vehicle approaches the closed gate the occupant will first pull the handle 12 laterally to release the gate-latch and will then pull down on the handle to lift the inner end of the sweep, and will, hence, through the medium of the link 22′, double the toggle 22 upwardly, and thereby pull the sliding head toward the gate-post 1, and thus swing the gate open and lock the same in the opened position. After the vehicle has passed through and beyond the gateway the occupant closes the gate by pulling down on the handle 12 at the opposite side of the gate, and thus again raises the inner ends of the sweeps and through the medium of link 23′ doubles the toggle 23 upwardly, and hence pulls the sliding head toward post 6 and operates the gate opening and closing toggle and closes the gate.

It is evident that various changes might be made in the forms, constructions, and arrangements of the parts described without departing from the spirit and scope of my invention. Hence I do not wish to limit myself to the constructions shown.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In combination, a gate-post, a gate hinged thereto, a supporting-frame, a horizontally-swinging gate opening and closing toggle comprising the long link hinged to the gate and the short link formed of a metal loop having the long link pivoted in its closed free end and having its widely-separated ends hinged by vertical pivots to said post at the side thereof opposite the gate, and mechanism for operating the toggle to open and close the gate, substantially as described.

2. In combination, a support, a swinging gate, a horizontally-swinging gate opening and closing toggle comprising a swinging loop hinged to the support and a link hinged to the gate and at its opposite end pivoted in the closed end of the loop, a reciprocating member, manually-operated means comprising oppositely-working toggles for reciprocating said member in opposite directions, and a link from said member to said toggle loosely joined thereto by the pivot between the link and loop thereof, substantially as described.

3. A gate opening and closing mechanism comprising manually-operated actuating devices, a pair of oppositely-working toggles, a reciprocating member connecting and reciprocated by said toggles, operating connections between said actuating devices and said toggles, and gate opening and closing connections operated by said member, substantially as described.

4. In combination, a swinging gate, a support, a reciprocating member, gate opening and closing connections between said member and the gate, toggles for reciprocating said member in opposite directions and locking the same at its limits of movement in opposite directions to hold the gate open or closed, and means for operating said toggles, substantially as described.

5. The gate opening and closing mechanism comprising a sliding head, a guide and support therefor, operative connections between said head and the gate for opening and closing the gate, oppositely-working toggles for reciprocating said sliding head in opposite directions, and operating devices for said toggles, substantially as described.

6. A gate opening and closing mechanism comprising vertically-swinging sweeps, a pair of oppositely-working toggles, operative connections from said sweeps to said toggles to break and straighten said toggles alternately, a gate-moving device, and operative connections between the same and said toggles, substantially as described.

7. A gate opening and closing device comprising a gate, a support, a toggle coupled to the gate and to the support to open and close the gate, a guide, a sliding head thereon, operative connections from the slide to said toggle, a pair of oppositely-working toggles coupled to said slide to reciprocate the same in opposite directions, operating devices, and pull connections from said operating devices to said oppositely-working toggles, respectively, substantially as described.

8. In combination, a support, a gate, a rigid slideway or guide, a slide longitudinally movable thereon, operative connections between said slide and the gate to open and close the same as the slide reciprocates in opposite directions, a pair of vertically-movable toggles, at their outer ends coupled at fixed points beyond opposite ends of said slide, the inner end of the toggles loosely coupled to said slide so that when one toggle is straightened out and locked on said slideway the other toggle is doubled or broken upwardly, operating devices, and pull-links therefrom to the joints of the toggles, respectively, substantially as described.

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

JOSHUA FRANK BARNES.

Witnesses:
IDA N. BABB,
A. S. BABB.