

**No. 638,633.**

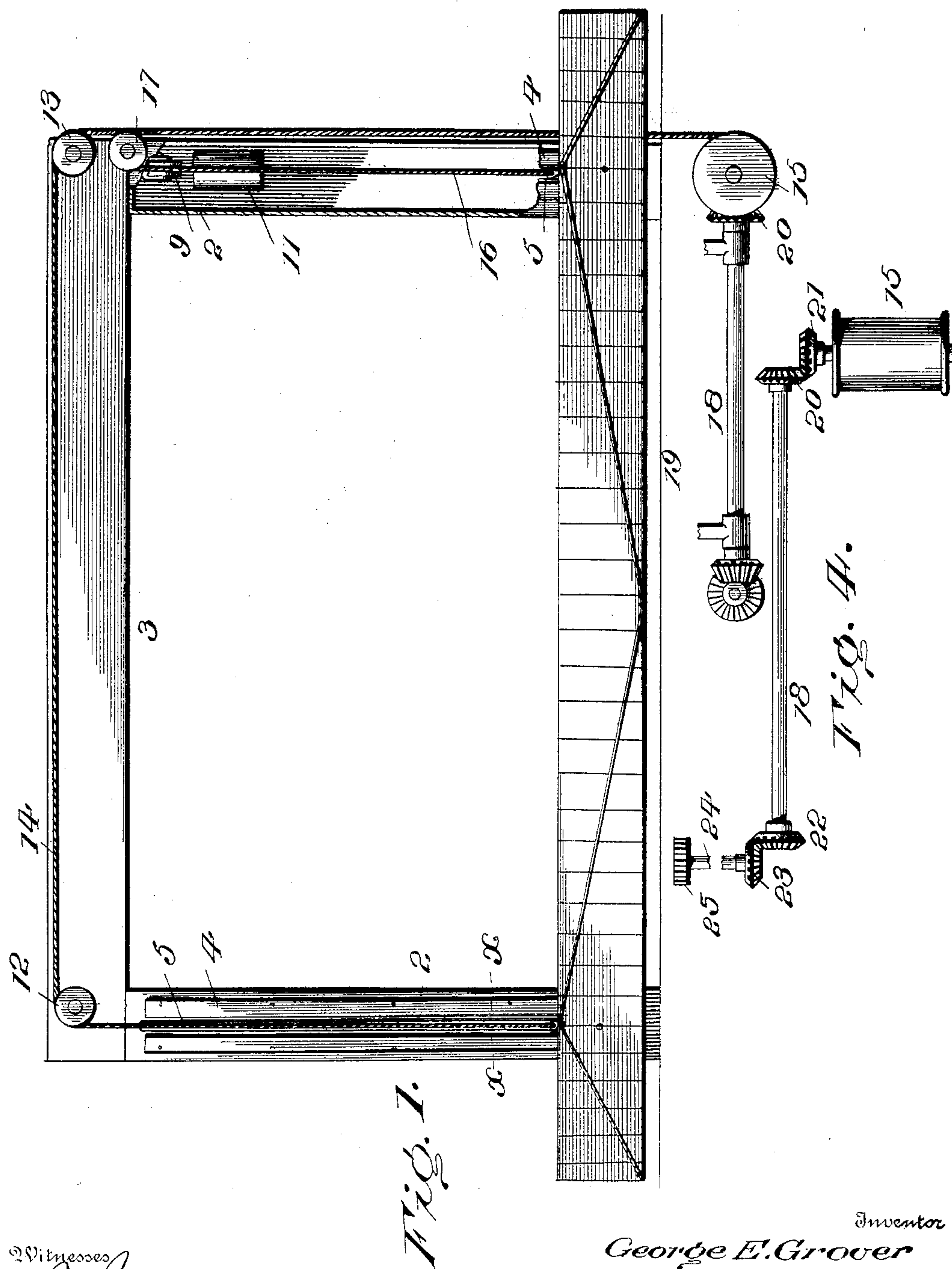
**Patented Dec. 5, 1899.**

**G. E. GROVER.**  
**AUTOMATIC GATE FOR BRIDGES.**

(Application filed July 18, 1899.)

(No Model.)

2 Sheets—Sheet 1.



2 Witnesses,

2 Witnesses  
J. J. Miller  
Gladys L. Thompson,

Inventor  
*George E. Grover*

by R. A. Rice his Attorney

No. 638,633.

Patented Dec. 5, 1899.

G. E. GROVER.  
AUTOMATIC GATE FOR BRIDGES.

(Application filed July 18, 1899.)

(No Model.)

2 Sheets—Sheet 2.

FIG. 2.

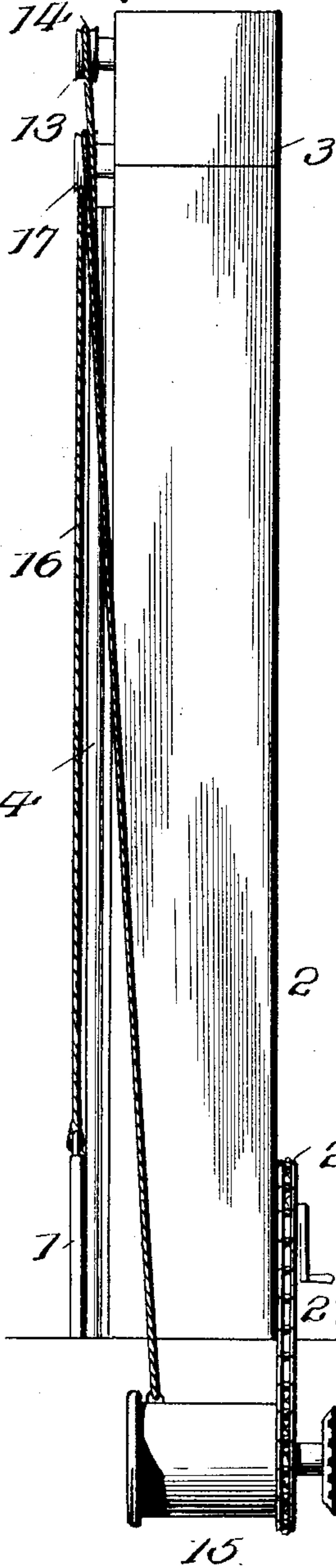


FIG. 3.

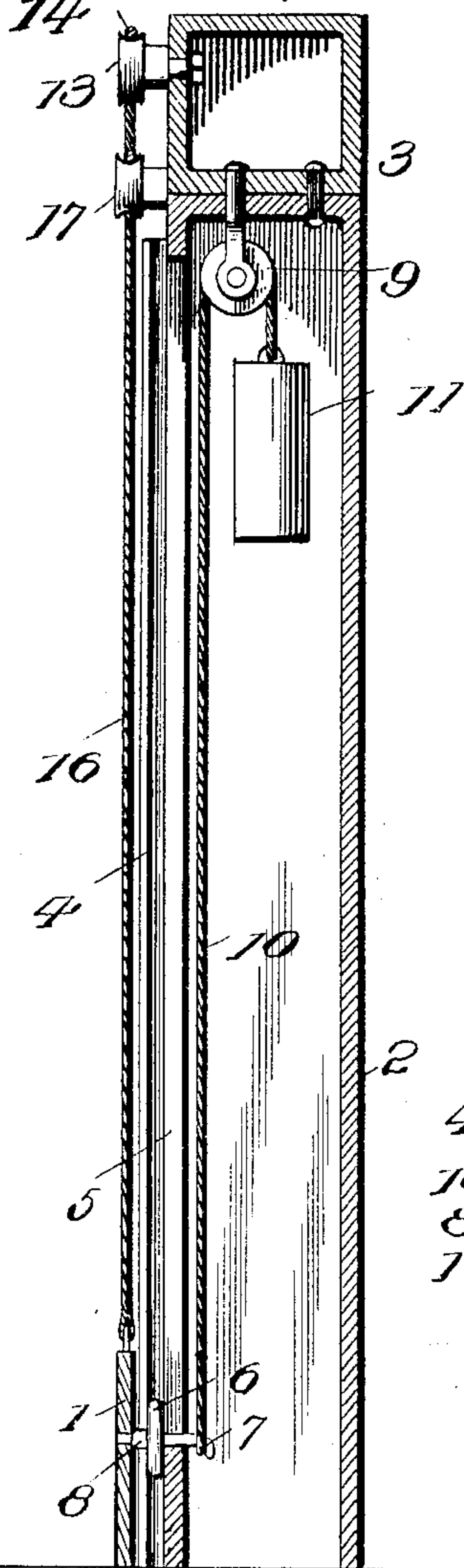


FIG. 6.

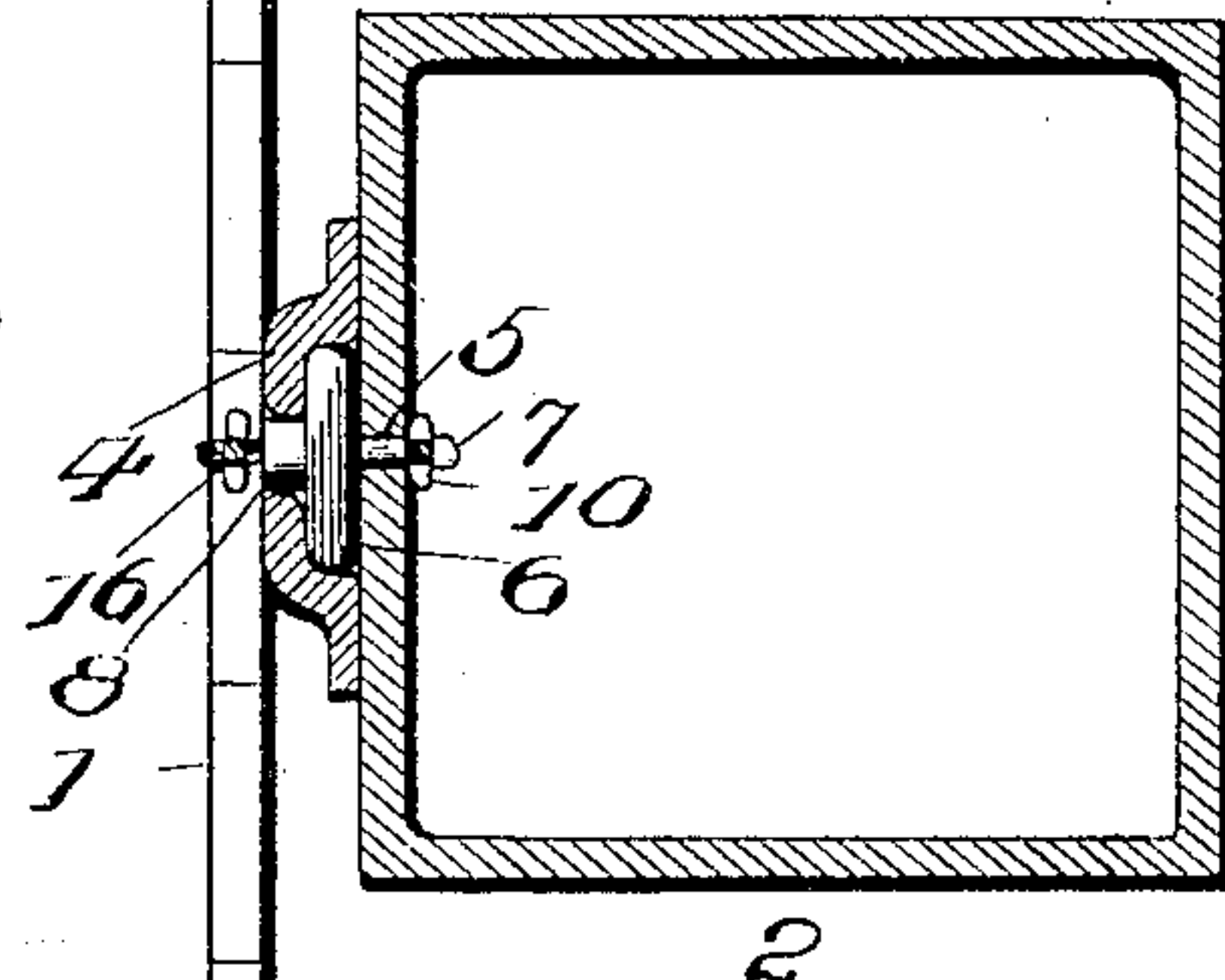
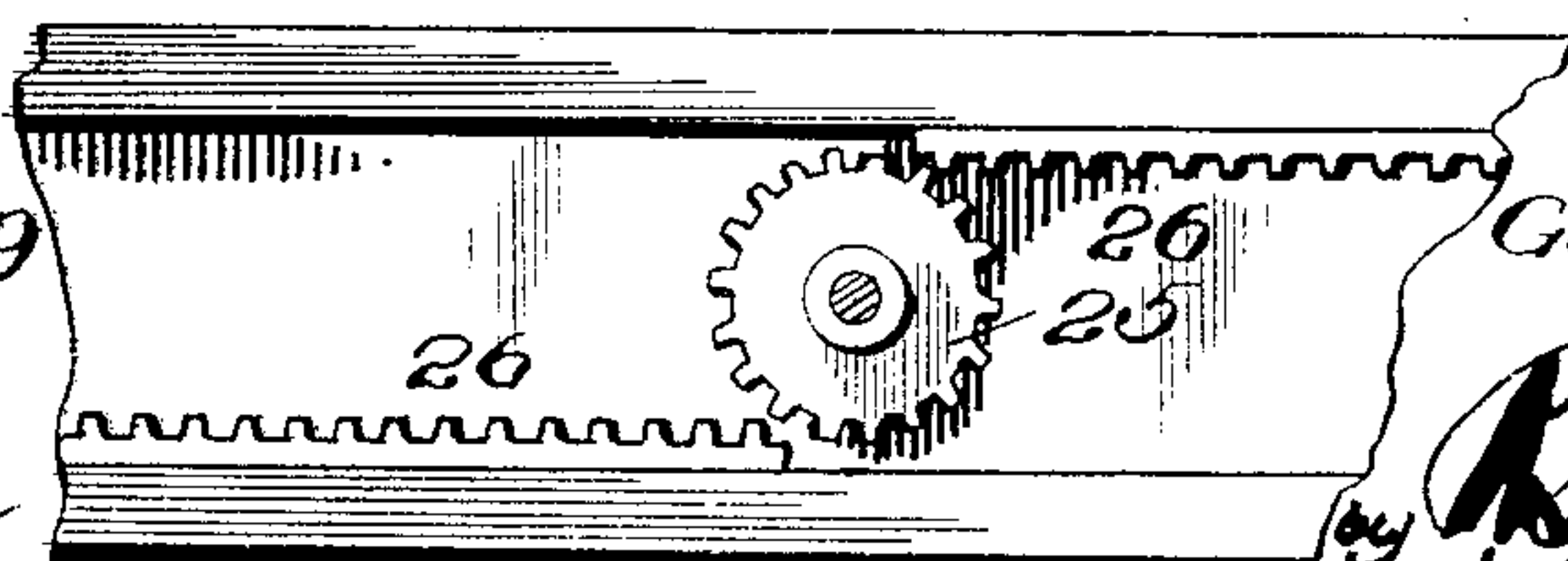


FIG. 5.



Witnesses  
*John J. Miller*  
*Wm. L. Thompson*

Inventor  
*George E. Grover*  
*Wm. L. Roney*  
Attorneys



# UNITED STATES PATENT OFFICE.

GEORGE E. GROVER, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO  
JOHN H. GODDEN, OF EMMETSBURG, IOWA.

## AUTOMATIC GATE FOR BRIDGES.

SPECIFICATION forming part of Letters Patent No. 638,633, dated December 5, 1899.

Application filed July 18, 1899. Serial No. 724,256. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE E. GROVER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Gates for Bridges; 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 gates for draw or swing bridges, the object being to provide a gate of this character which can be operated either automatically or by hand or power, as required.

The invention relates to the novel mountings for the gate and its actuating mechanism.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and the drawings hereto attached.

While the essential and characteristic features of the invention are necessarily susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a front view of the gate, showing a post or column in section. Fig. 2 is an end view. Fig. 3 is a detail vertical section. Fig. 4 is a plan view of the power-transmitting mechanism. Fig. 5 is a detail view of the draw or swing bridge, showing the relative position of the gearing when the bridge is open for traffic. Fig. 6 is a detail plan section on the line X X of Fig. 1.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Inasmuch as the purpose of the invention is to close traffic when the draw or swing portion of the bridge is open, it is to be understood that each terminal of the bridge abutting upon the space closed by the draw or swing portion is to be similarly equipped, and for the sake of simplicity of illustration and description only one gate and set of actuating devices therefor will be referred to.

The gate 1 is located at the end of the fixed portion of the bridge and is of a length to extend across the roadway and footpath, so as to close all approaches when the draw is swung upon its vertical axis to admit of a boat or vessel passing by the bridge. The frame consists of vertical posts or columns 2 and a cross-piece 3, said parts being preferably hollow and composed of metal walls. Vertical guides 4 are applied to corresponding faces of the posts or columns 2 and consist of plates having their inner edge portions deflected or offset. The portion of the posts or columns located between the guides of each pair are slotted, as shown at 5, the vertical slots 5 extending nearly the entire length of the columns. A slide 6 is provided to operate in conjunction with each pair of guides 4 and is provided with a hook 7, which traverses the slot 5. Each of the slides 6 is formed with a neck portion 8, which operates between the guides and to which the gate is attached. It will thus be seen that the gate is held to the vertical posts and is directed in its vertical movements by means of the slides 6. The outwardly-deflected edge portions of the guides 4 embrace opposite edge portions of the slides 6 and prevent outward displacement thereof, and these guides are spaced apart a distance corresponding to the diametrical extent of the neck portions 8, so as to admit of the latter having free vertical movement without lateral play.

Pulleys 9 are located at the upper ends of the posts or columns 2, and a rope or cable 10 passes around each and is provided at one end with a weight 11 and has its opposite end attached to the hook 7 of the respective slides. The weights 11 counterbalance the gate 1, whereby the latter is adapted to be operated by a minimum amount of force. The pulleys 9 and weights 11 are located within the columns 2 and are protected and concealed from view thereby.

A direction-pulley 12 is located at one end of the cross-piece 3, and a corresponding direction-pulley 13 is located at the opposite end of said cross-piece. A rope or cable 14 passes over the direction-pulleys 12 and 13 and is connected at one end with an end portion of the gate 1 and has its opposite end se-



cured to and adapted to wind upon the drum 15. A second rope or cable 16 is attached at one end to the opposite end portion of the gate and passes over a direction-pulley applied to the end portion of the cross-piece 3 at a point below the direction-pulley 13 and is secured to the rope or cable 14 adjacent to the pulley 17. It will thus be seen that as the rope 14 is wound upon the drum 15 the rope or cable 16 will be likewise drawn upon, and thereby effect a simultaneous vertical movement of both ends of the gate 1. The drum 15 is conveniently located, preferably, at a point below the surface of the bridge, so as to have the power conveniently applied thereto for closing the gate simultaneously with the opening of the draw or swing portion of the bridge.

A transverse shaft 18 is located opposite the end of the draw 19 and is provided at one end with a miter-gear 20, intermeshing with a companion miter-gear 21, applied to the shaft of the drum 15. A miter-gear 22 is applied to the opposite end of the shaft 18 and meshes with a corresponding miter-gear 23 at the end of a longitudinal shaft 24, provided at its outer end with a cog-gear 25, the latter being disposed in the plane of oppositely-disposed racks 26, attached to the end of the draw or swing portion 19 of the bridge and having their inner ends terminating about at a central point. This disposition of the gearing 25 and 26 enables the gate to be operated upon opening the draw in either direction. In some instances it may be desirable to have the gate under control, and for this purpose a sprocket-chain 27 connects spur-gearing of the drum 15 with a pinion 28, journaled to the post or column in line with said drum, and which pinion is adapted to have a crank or handle applied to the journal thereof.

When the bridge is open for traffic, the gate is elevated, and when the draw or swing portion is turned to close traffic the gate is lowered, thereby giving warning and preventing a person or team from meeting with accident by passing over the terminal of the approach or fixed portion of the bridge. When the

draw or swing portion is closed, the gate is again elevated, thereby opening the bridge to traffic.

Having thus described the invention, what is claimed as new is—

1. In a gate for bridges, the combination with vertical posts having vertical slots in corresponding sides, guideways applied to the posts and disposed at the side of the slots thereof, and a gate, of slides applied to said guideways and having projecting portions extending through the vertical slots of the posts, and counterbalancing means operatively connected with the projecting portions of said slides, substantially as set forth.

2. In a gate for bridges, the combination of vertical posts having vertical slots and provided with guides at the sides of said slots, a gate, slides attached to the gate and operating in the guides and provided with projecting portions extending into the slots of the said posts, counterbalancing means having connection with the projecting portions of said slides, a drum, and ropes or cables connecting opposite end portions of the gate with the said drum, substantially as and for the purpose set forth.

3. In combination, hollow posts connected at their upper ends by a cross-piece, said posts having vertical slots in corresponding sides, guides applied to the posts and located at the sides of the slots thereof, a gate, slides connected with the gate and fitted to operate in the said guides and having projecting portions extending through the slots of the posts, counterbalancing-weights located within the posts and connected with the projecting portions of said slides, a drum, ropes or cables connecting said drum with the opposite end portions of the gate, and actuating means for the drum, as and for the purpose set forth.

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

GEORGE E. GROVER. [L. S.]

Witnesses:

J. E. INGRAM,  
WILLIAM J. KING,  
JOHN F. KING.