(No Model.) 2 Sheets—Sheet 1.

T. H. ANDREW.

GUARD FOR BRIDGES.

No. 566,960. Patented Sept. 1, 1896.

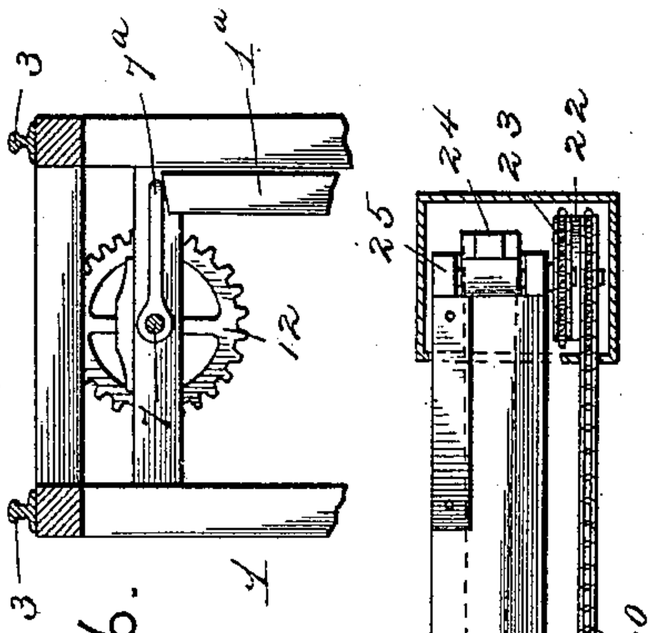

FIG. 6.

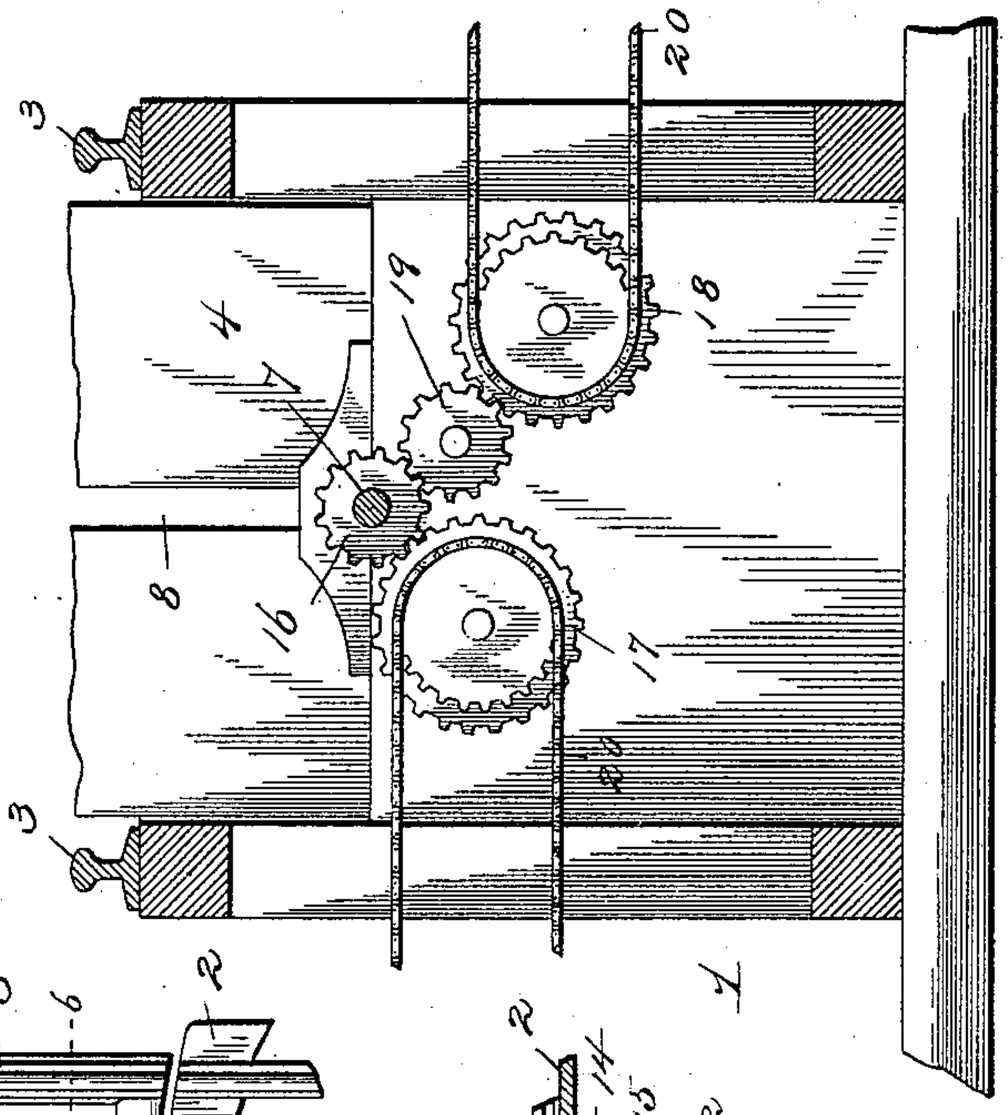

FIG. 5.

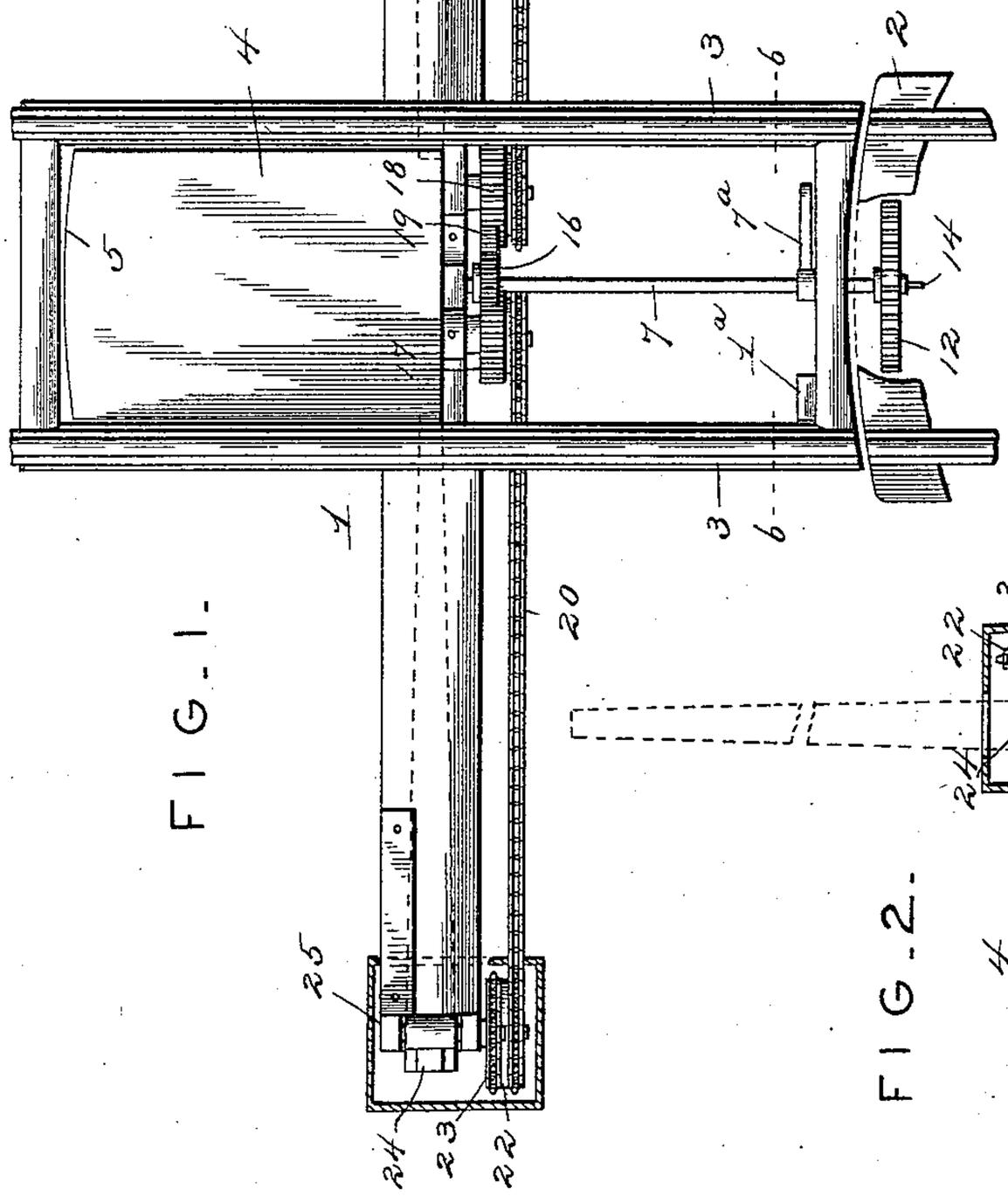

FIG. 1.

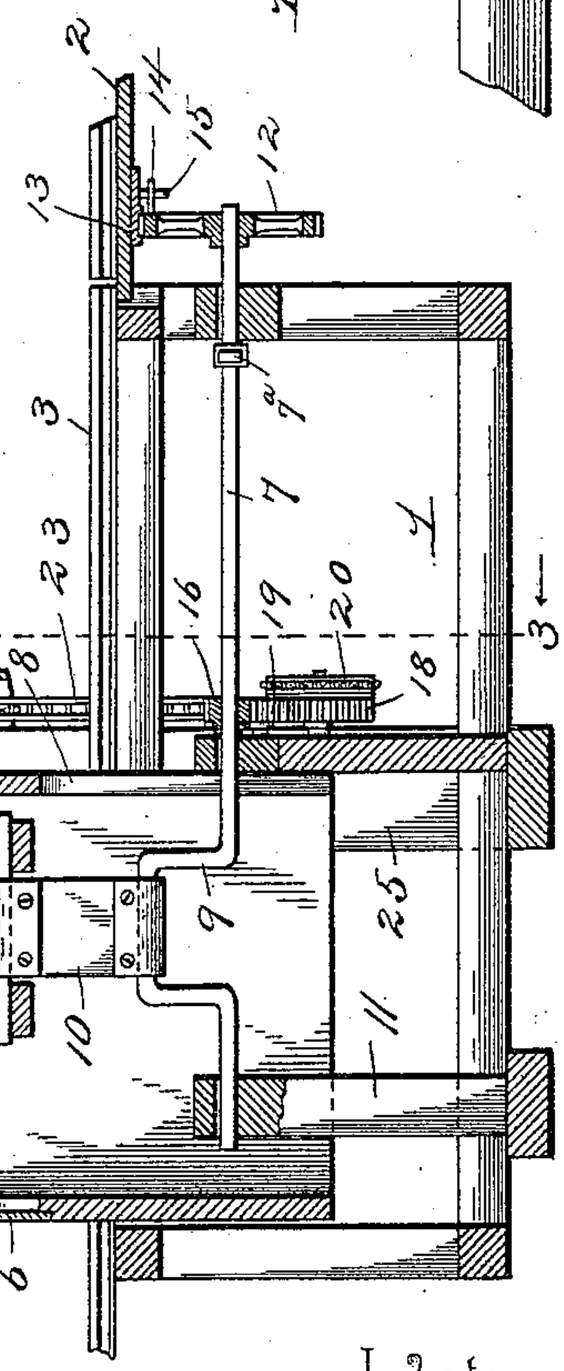

FIG. 2.

Witnesses
Harry L. Amer.
H. J. Riley

Inventor
Thomas H. Andrew.
By his Attorneys,
C. A. Snow & Co.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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FIG. 3.

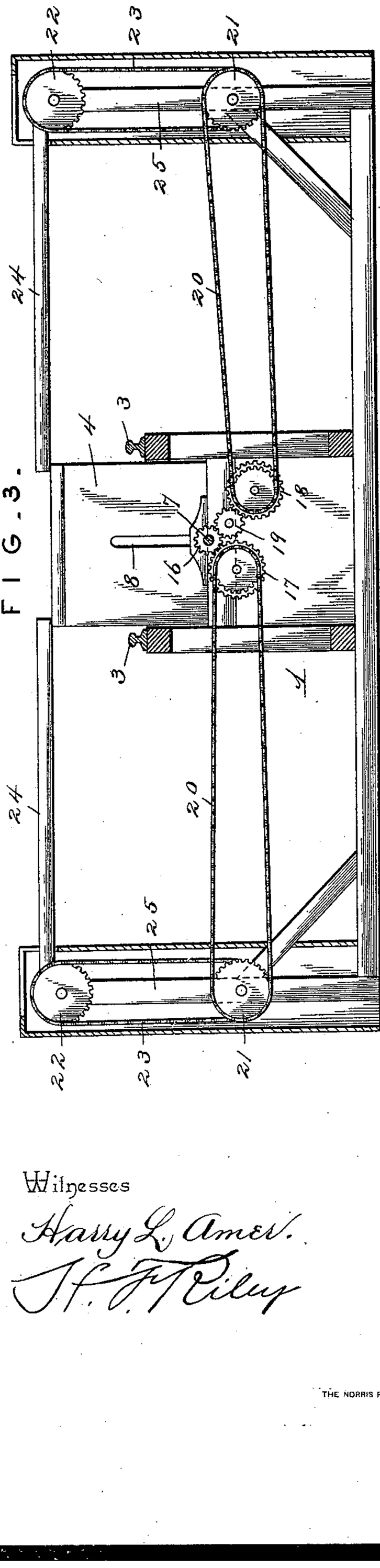

FIG. 8.

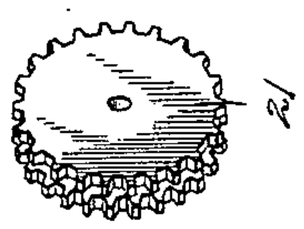

FIG. 4.

FIG. 7.

Inventor

Thomas H. Andrew.

Witnesses

Harry L. Amer.

J. F. Riley

By His Attorneys,

C. A. Snow & Co.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMAS HENRY ANDREW, OF LEMARS, IOWA, ASSIGNOR OF ONE-THIRD TO WM. J. ANDREW, OF SAME PLACE.

GUARD FOR BRIDGES.

SPECIFICATION forming part of Letters Patent No. 566,960, dated September 1, 1896.

Application filed March 25, 1896. Serial No. 584,810. (No model.)

To all whom it may concern:

Be it known that I, THOMAS HENRY ANDREW, a citizen of the United States, residing at Lemars, in the county of Plymouth and State of Iowa, have invented a new and useful Guard for Bridges, of which the following is a specification.

The invention relates to improvements in guards for street and railway bridges.

The object of the present invention is to provide a simple, inexpensive, and efficient guard adapted to be operated by the opening of a bridge and capable of effectively obstructing or blockading a street or way to prevent a train of cars, vehicles, or pedestrians from falling through an open bridge.

A further object of the invention is to provide a guard which will be positive and reliable in operation, and which will possess sufficient strength and durability to stop a train while in motion and when the same is running at considerable speed.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a plan view of a bridge-guard constructed in accordance with this invention. Fig. 2 is a longitudinal sectional view. Fig. 3 is a transverse sectional view on line 3 3 of Fig. 2. Fig. 4 is an end elevation, partly in section, illustrating the construction of the gearing for operating the bridge-guard. Fig. 5 is an enlarged sectional view illustrating the arrangement of the gearing for transmitting motion from the longitudinal shaft to the masts or gate-bars. Fig. 6 is a detail sectional view on line 6 6 of Fig. 1, the arm of the longitudinal shaft being in engagement with the stop of the supporting-frame. Figs. 7 and 8 are detail perspective views of the double gear-wheels.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a supporting-frame designed to be mounted in or form a portion of an abutment of a bridge 2, which may be either a street or a steam railway bridge, and at the top of the supporting-frame are arranged rails 3 of a track. The outer end of the frame or abutment is concave to receive the slightly-rounded end of the bridge, which is designed to be centrally pivoted and to make a quarter-turn in opening and closing in the usual manner.

At the inner portion of the supporting-frame is arranged a vertically-movable body or frame 4, arranged between the rails and having its upper face normally flush with the surface of the road-bed. The vertically-movable body or frame, which may be constructed of any suitable material, and which is rectangular in cross-section, is adapted, when the bridge is open, to be elevated above the track, as illustrated in Fig. 2 of the accompanying drawings, to operate as a stop or bumper to obstruct the track and prevent a train of cars from falling through an open bridge, and it is constructed of sufficient strength to stop a car or a train of cars when in motion and moving at considerable speed. The end 5 of the bumper is preferably rounded or convex, as shown, and it is designed to be provided with a luminous signal 6, hereinafter described. The vertically-movable frame or body is raised and lowered by a longitudinal shaft 7, journaled in suitable bearings of the supporting-frame and extending through a vertical slot 8 of the inner end of the frame or body 4. The shaft is provided at its inner end within the frame or body 4 with a crank-bend 9, which is connected with the top of the vertically-movable frame or body 4 by a link-bar 10, and the inner end of the shaft 7 is journaled in a suitable bearing of a vertical post 11, located within the frame or body 4, which is hollow, as shown.

The outer end of the horizontal shaft 7, which is disposed longitudinally within the track, has keyed or otherwise fixed to it a vertically-arranged transversely-disposed spur gear-wheel 12, located beyond the abutment and adapted to mesh with the curved rack-bar 13, secured to the under side of the bridge 2 and located at the top of the gear-wheel 12. When the bridge is opened, the rack-bar, by meshing with the gear-wheel 12, rotates the shaft 7, swinging upward the crank-bend thereof, or other eccentric connection employed, and moving the frame or body 4 ver-

tically, and the rack-bar then leaves the gear-wheel, the frame or body 4 remaining in an elevated position. As the bridge closes the gear-wheel 12 is partially rotated in a reverse direction and the crank-bend swings downward, lowering the frame or body 4, and the gear-wheel and the rack-bar are provided with pins 14 and 15, adapted to engage each other, as the bridge closes, to form a guide for the gearing and to insure the operation of the parts.

When the frame or body 4 is elevated, it is supported by an arm 7^a, fixed to the longitudinal shaft 7 a short distance from the gear-wheel 12 and located within the supporting-frame, and the arm 7^a is adapted to engage and be supported by a stop 1^a, which preferably consists of a post, but any other desired construction may be employed for forming a rest or stop for the arm 7^a of the longitudinal shaft. As the crank-bend of the longitudinal shaft swings upward to a perpendicular position the arm 7^a is carried toward the stop 1^a, and the latter is engaged by the arm 7^a after the crank-bend has passed a perpendicular position, whereby the weight of the body or frame 4 is supported by the stop of the frame 1. By this construction the gearing is relieved of all strain when the frame or body 4 is in an elevated position.

The longitudinal shaft carries at a point intermediate of its ends a pinion 16, from which motion is communicated to double gear-wheels 17 and 18, having spur and sprocket teeth. The gear-wheel 17 meshes directly with the pinions 16, and the other gear-wheel 18 is connected with the pinions 16 by an intermediate pinion 19. The double gear-wheels receive sprocket-chains 20 on their sprocket-teeth, and endless sprocket-chains extend horizontally from opposite sides of the supporting-frame to double gear-wheels 21, provided with two sets of sprocket-teeth and connected with upper gear-wheels 22 by vertically-disposed endless sprocket-chains 23. The sprocket-wheels 22 are connected with shafts or pintles of masts 24, mounted on posts or stands 25, and arranged normally in a vertical or upright position and adapted, when the bridge is opened, to be lowered by the gearing just described to substantially a horizontal position. When the masts are lowered to a horizontal position, their adjacent ends rest upon and are supported by the vertically-movable frame or body, and as the bridge closes the masts are swung upward.

The luminous signal 6 preferably consists of a plate of colored glass and an electric light provided with a suitable switch mechanism for automatically turning the light on when the bridge is opened and the frame or body elevated and for similarly extinguishing it when the bridge is closed.

The bridge-guard, as will readily be understood, is arranged at each end of the bridge, and it may be employed on street-railway or steam-railway bridges, and it may also be used on bridges on which no tracks are laid, and the vertically-movable body or frame may be used in conjunction with or independently of the mast-gates, as desired.

It will be seen that the bridge-guard is simple and comparatively inexpensive in construction, that it possesses great strength and durability, sufficient to stop a car or a train of cars while the same are in motion, and that it is positive and reliable in operation. It will also be seen that the gearing is concealed and protected from injury, and that the vertically-movable frame or body, when not in use, is also concealed and its upper surface flush with the surface of the road-bed when it is in its normal position, and that it is adapted to obstruct and effectually barricade a street or way when the bridge is opened.

What I claim is—

1. In a bridge-guard, the combination of a vertically-movable frame or body, a longitudinal shaft having a crank or eccentric, a link-bar connecting the crank or eccentric with the vertically-movable frame or body, a gear-wheel located beyond the abutment and provided with a horizontally-disposed pin, and a rack-bar designed to be carried by a bridge and meshing with the gear-wheel, and provided with a depending pin adapted to engage the pin of the gear-wheel, substantially as described.

2. In a bridge-guard, the combination of a vertically-movable frame or body, a shaft having a crank or eccentric connected with and adapted to actuate the frame or body, means for communicating motion from a bridge to the shaft, mast-gates located at opposite sides of the vertically-movable body, and gearing connecting the mast-gates with the body, whereby the former will be operated simultaneously with the latter, substantially as described.

3. In a bridge-guard, the combination of a vertically-movable frame or body, a longitudinal shaft having a crank or eccentric connected with the frame or body and adapted to raise and lower the same, double gear-wheels located adjacent to the shaft and provided with spur and sprocket teeth, pinions meshing with the spur-teeth and connecting the double gear-wheels with the shaft, mast-gates provided with posts or stands, the upper and lower sprocket-wheels mounted on the posts or stands, the lower sprocket-wheel being provided with a double set of teeth, and horizontally and vertically disposed sprocket-chains arranged on said sprocket-teeth and connecting the mast-gates with the longitudinal shaft, whereby the vertically-movable gate will be simultaneously operated, substantially as described.

4. In a bridge-guard, the combination of a vertically-movable frame or body, a longitudinal shaft having a crank or eccentric, a link-bar connecting the crank or eccentric with the vertically-movable frame or body, means for rotating the longitudinal shaft to

raise and lower the frame or body, a stop, under an arm fixed to the longitudinal shaft and arranged to engage the stop when the frame or body is in an elevated position and after the crank or eccentric has passed a perpendicular position, substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

THOMAS HENRY ANDREW.

Witnesses:

W. H. BOYD,

GEO. D. WERNLI.