

(No Model.)

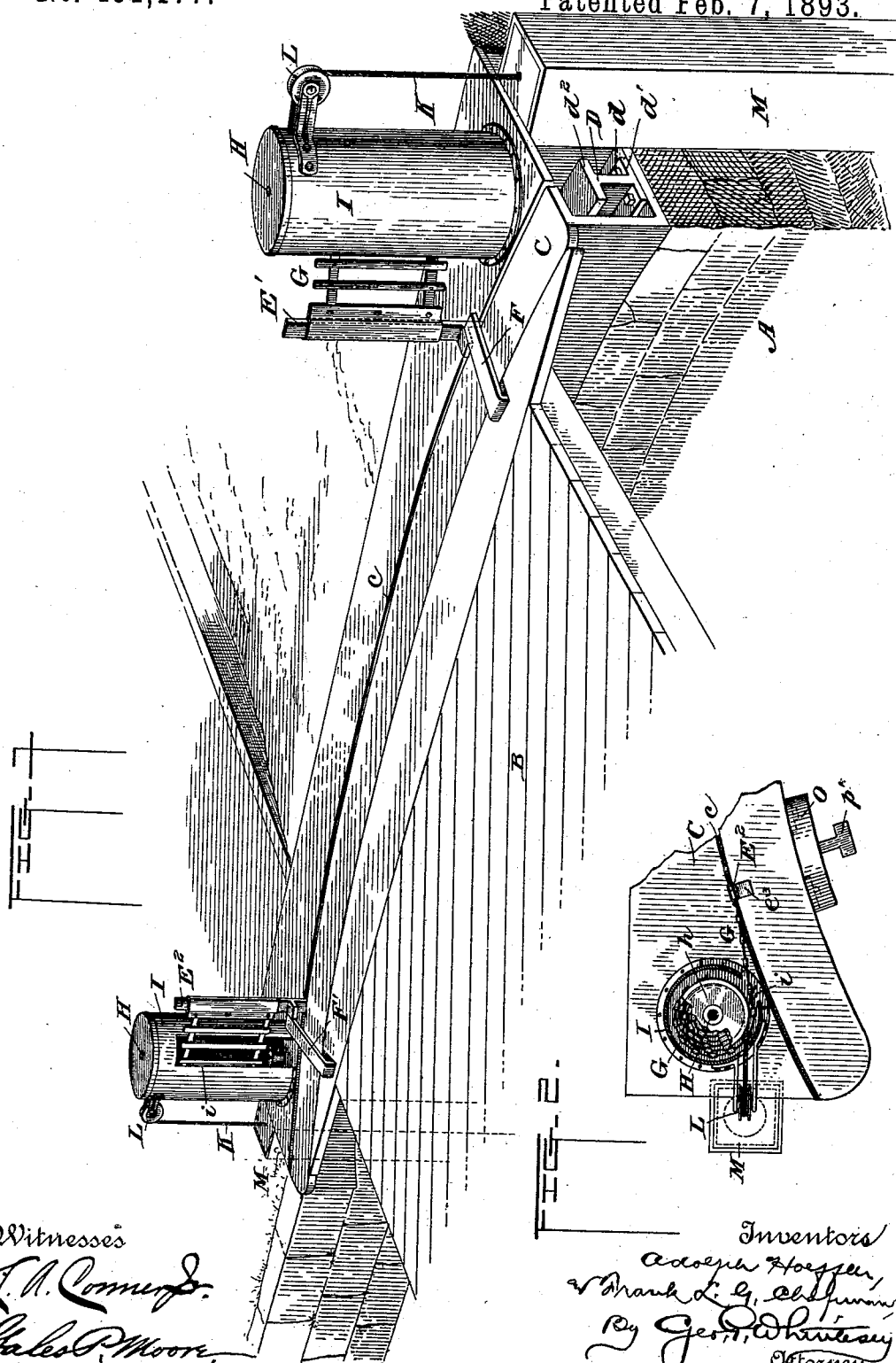
3 Sheets—Sheet 1.

A. HÖEFFLER & F. L. G. CHAPMAN.

SAFETY GATE FOR DRAWBRIDGES.

No. 491,177.

Patented Feb. 7, 1893.



Witnesses
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Inventors
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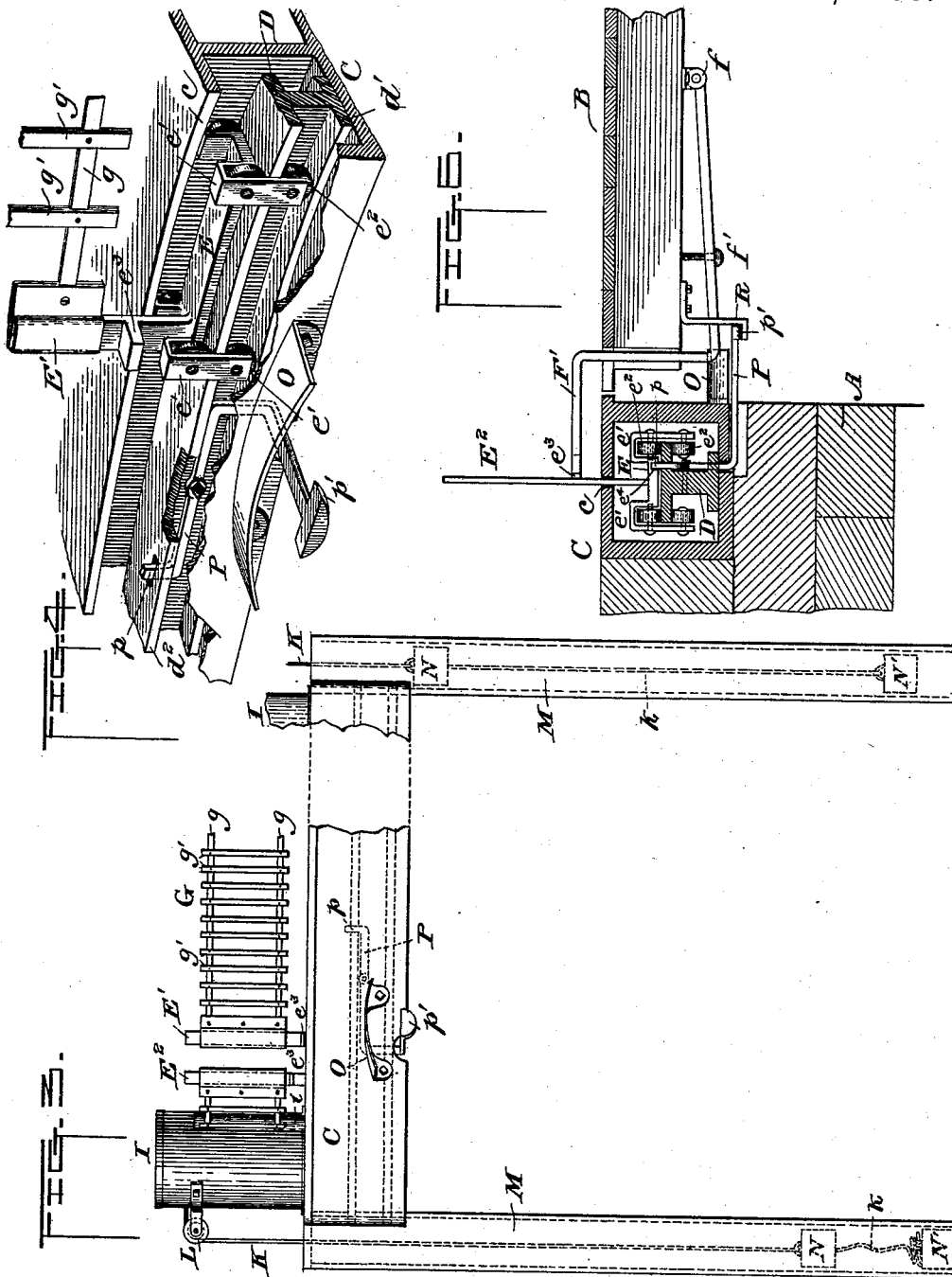
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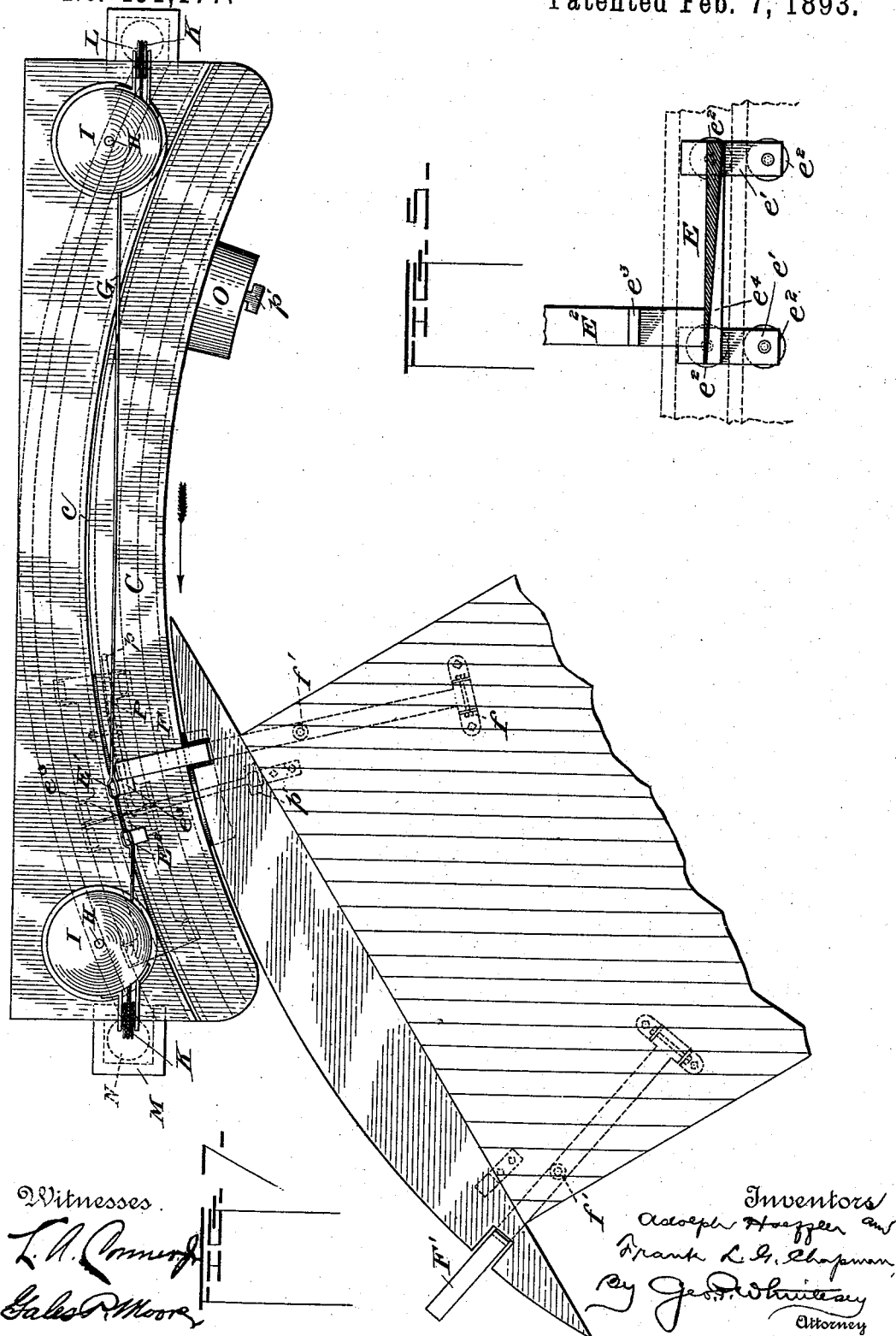
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3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

ADOLPH HOFFLER AND FRANK L. G. CHAPMAN, OF STEVENS POINT,
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SAFETY-GATE FOR DRAWBRIDGES.

SPECIFICATION forming part of Letters Patent No. 491,177, dated February 7, 1893.

Application filed December 21, 1891. Serial No. 415,793. (No model.)

To all whom it may concern:

Be it known that we, ADOLPH HOFFLER and FRANK L. G. CHAPMAN, citizens of the United States, residing at Stevens Point, in the county of Portage and State of Wisconsin, have invented certain new and useful Improvements in Safety-Gates for Drawbridges; and we do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Our invention relates to safety gates for drawbridges and its object is to render such gates automatic in their operation, and efficient and reliable in action. To this end we arrange at each side of the street or roadway and near the edge of the quay or pier an upright drum or shaft on which is wound a flexible gate. The end of the pivoted or swing bridge is provided with appliances for engaging with these gates, and drawing one or the other of them across the roadway when the draw is opened. The gate is locked in this position, but is automatically released and wound up when the draw is closed again. Our improvements render it immaterial whether the draw be swung one way or the other, nor is it necessary to close the draw in the reverse direction of opening it: since it may be swung completely around without interfering with the automatic operation of our gates.

In the accompanying drawings, Figure 1 is a perspective view of one end of a drawbridge and the adjacent quay provided with our improved gates. Fig. 2 is a top plan view of one of the gate-houses partly in section. Fig. 3 is an elevation of one of said houses and its weight well. Fig. 4 is a perspective view of a conduit, track and carriage, partly broken away. Fig. 5 is a longitudinal section of a carriage, and Fig. 6 is a cross sectional view of a conduit and the end of the bridge. Fig. 7 is a plan, showing the bridge partly open.

Our improvements are applicable to one or both ends of a horizontally swinging bridge. They may be used where the bridge swings

always in the same direction, or indifferently in either direction. In the former case, only one gate is needed: in the latter, two gates are required. We have illustrated a bridge adapted to swing in either direction.

The quay A and bridge B may be of any suitable construction. Along the edge of the quay we place a conduit C, which may consist of a box, having its upper surface flush with the roadway, and containing a slot *c* arranged preferably parallel with the end of the bridge: that is, on a curve struck from a pivot on which the bridge turns. The slot, may however, be straight if desired.

Within the conduit, is a track D, consisting preferably of a T-shaped rail secured to the bottom of the conduit: as for instance, by bolts *d* passing through flanges *d'*. Carriages E are arranged to run on this track. We prefer the construction shown, in which the carriage comprises a body E, provided at each end with depending bent arms *e'* which may engage directly with the head of the rail, but which preferably carry the wheels *e''*, one pair in each arm. The upper wheel of each pair is adapted to rest upon the upper surface of the track D and so support the carriage. The lower wheel of each pair lies under one of the flanges *d''*, which form the T-head of the track. Said lower wheels thus hold the carriage upon the track and prevent it from displacement.

Rising from the body of the carriage is a standard *E'* *E''* which projects through the slot *c*, and is fastened to one end of the gate. A little above the slot the standard has a lug *e'''*, with which a latch F or F' on the bridge can engage and move the carriage along the track, when the bridge is turned.

The gates G consist of a band or bands of flexible material, capable of being wound and unwound without injury. We prefer to use two or more belts *g* having attached to them a series of vertical slats *g'*. One end of the gate, as has been said, is fastened to the standard of the carriage. The other end is secured to a vertical shaft H, protected by a casing or house I, in which is an opening *i* to admit the gate.

Secured to the upper end of the shaft is a drum *h* on which is wound a cord or chain K, which passes over a pulley L, arranged either

outside or inside the gate-house, and thence down into a well M, where it is fastened to a weight N. When the gate is closed the chain is wound up on the drum and the weight is raised. A second weight N' is suspended below the weight N by a chain k, said chain being a little shorter than the amount of travel of the carriage, so that when the carriage has arrived almost at the end of its track, and the gate is nearly closed, the weight N' will be raised off the bottom of the well. This extra weight holds the gate stiff and firm when closed, and assists in starting back the carriage when released.

The fingers or latches F F' are hinged to the bridge, so that they can be lifted when necessary. We prefer to make them as shown in Fig. 6, that is, a bar bent twice at about right angles, and arranged with one horizontal portion above the flooring of the bridge, and the other similar portion below the bridge, the intermediate vertical portion passing through a slot in the flooring. The end of the lower portion is hinged at f' to the bridge, and a stop f' holds the latch at the proper height to engage with the lug e³ on the standard of the carriage. When the moving bridge has by means of this latch propelled the carriage across the roadway and closed the gate, the lower part of this latch strikes a cam or curved plate O fastened to the quay or conduit, and is thereby lifted and disengaged from the lug e³, permitting the bridge to move on to open the draw and leaving the carriage.

To prevent the carriage from immediately being pulled back by the weight N N', we provide a stop, which engages with the carriage and locks it. Such a stop is shown in Figs. 3, 4 and 6, being a lever P, fulcrumed on the vertical web of the rail D, and having at one end a finger p projecting up through a slot in the flange d². The other end of the lever is weighted to keep the finger normally raised.

In the under side of the body of the carriage is an inclined groove e⁴, arranged to receive the finger p, and force it down when the carriage is being moved to open the gate. As soon as the carriage passes the finger, the latter instantly rises, and engaging with the rear end of the carriage serves as a stop to prevent it from returning.

The operation of the invention is as follows: Let the bridge be in the position shown in Fig. 1. At each side is a latch F or F' engaging with its respective standard E' E², so that in whichever direction the bridge is turned, one of the gates will be closed across the roadway. Suppose the draw to be moved to the left in Fig. 1, so as to close the right hand gate, as shown in Fig. 3. When the latch F is lifted by the cam O, it passes over the lug e³ with which it had been engaged, but under the lug e³ of the other standard E², said second lug being located on a higher level than the other, as clearly shown in Fig. 3. The latch F' which engages with this lug is of course, adjusted to stand higher than the latch

F. The draw having been opened, suppose it now to be closed by returning over the path traveled in opening. The latch F will pass under the lug e³ on the standard E², strike the cam O, and be lifted over the lug e³ on the standard E' of the closed gate. An arm R depending from the bridge, at this instant disengages the stop which holds the carriage, and the latter is immediately drawn back by the weights, following the latch F until the draw comes to rest in the position shown in Fig. 1.

To enable the arm R to operate the stop, the weighted end of the lever P is bent outwardly, and provided with a curved head p', arranged in the path of the arm R, so that the latter will be carried under and lift the head p', thereby depressing the finger p and releasing the carriage. Other modes of effecting this result may be used. Again, suppose the draw to be closed, by continuing its motion in the direction of the arrow Fig. 1. When nearly closed, the arm R adjacent to the latch F' will raise the head p' of the stop and release the carriage, which is then drawn quickly back until the lug e³ strikes the latch F. The latch F' being the higher, has passed over the lug e³ of the standard E' and has been lifted by the cam O over the lug e³ of the standard E², so that the bridge comes to rest with the parts arranged as shown in Fig. 1. The arms R are so arranged with reference to the latches F F', that when the draw is closed the arms lie under the heads p' and the stops are depressed, so that the carriages are not prevented from being drawn by the weights firmly against their respective latches.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

1. The combination with a bridge of a flexible safety gate wound upon a vertical shaft, and adapted to be closed by the bridge when the latter is turned, a locking device to hold the gate closed, a releasing device attached to the bridge, and means for automatically winding up the gate when released, substantially as described.

2. The combination with a pivoted draw-bridge of a flexible safety gate wound upon a shaft and adapted to be closed by the bridge, a locking device to hold the gate closed, a releasing device attached to the bridge, and adapted to trip the locking device in whichever direction the bridge may be turned in closing the draw, and an automatically operating winding up device permanently connected with the gate, substantially as described.

3. The combination with a draw bridge of two flexible gates, wound upon shafts one on each side of the road way, and engaged by the bridge whereby a gate will be closed by the opening of the draw in either direction, locking devices to hold said gates closed, releasing devices attached to the bridge and adapted to release the closed gate when the draw is closed in either direction, and an au-

tomatically operating winding up device permanently connected with each gate, substantially as described.

4. The combination with a drawbridge of a flexible gate wound on a shaft, means for rotating said shaft, a latch pivoted on the bridge and engaging with the gate, a locking lever to hold the gate closed, a cam to disengage the latch from the gate, and an arm on the bridge to trip the locking lever when the draw is closed, substantially as described.

5. The combination with a drawbridge, of two flexible safety gates one on each side of the roadway, a pivoted latch on each side of the bridge engaging with a gate, a cam plate on each side of the roadway to disengage the latches, a pivoted stop near each cam plate to hold the gate closed, and an arm on the bridge near each latch to depress the stop and release the gate when the draw is closed, irrespective of the direction in which the bridge is turned, substantially as described.

6. The combination with a drawbridge, of a slotted conduit extending along the edge of the quay, a carriage traveling in the conduit, and having a standard projecting through the slot, and a safety gate attached to said standard, substantially as described.

7. The combination with a drawbridge, of a slotted conduit extending along the edge of the quay, a track in said conduit, a carriage traveling on said track and having a standard projecting through the slot, and a safety gate attached to said standard, substantially as described.

8. The combination with a drawbridge, of a slotted conduit extending along the edge of the quay, a T-headed rail in said conduit, a carriage, having arms adapted to engage with the head of the rail, and a standard projecting through the slot, and a safety gate attached to said standard, substantially as described.

9. The combination with the slotted conduit, of the T-headed rail, the carriage having the depending arms carrying wheels bearing on the upper and under side of the head of the rail, and the standard projecting up through the slot, substantially as described.

10. The combination with the slotted conduit, of the rail, the carriage traveling thereon, and having an inclined groove in its under side, and the lever pivoted in the conduit and having a finger projecting up through a slot in the rail substantially as described.

11. The combination with a drawbridge, of the latches pivoted thereto, one being higher than the other, the two safety gates, the carriage having standards to which said gates are attached, and the lugs on the standards arranged at different heights, so that each is engaged by its respective latch, only, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

ADOLPH HOFFLER.

FRANK L. G. CHAPMAN.

Witnesses:

R. H. BUTTERFIELD,

H. M. WADLEIGH.