

No. 626,970.

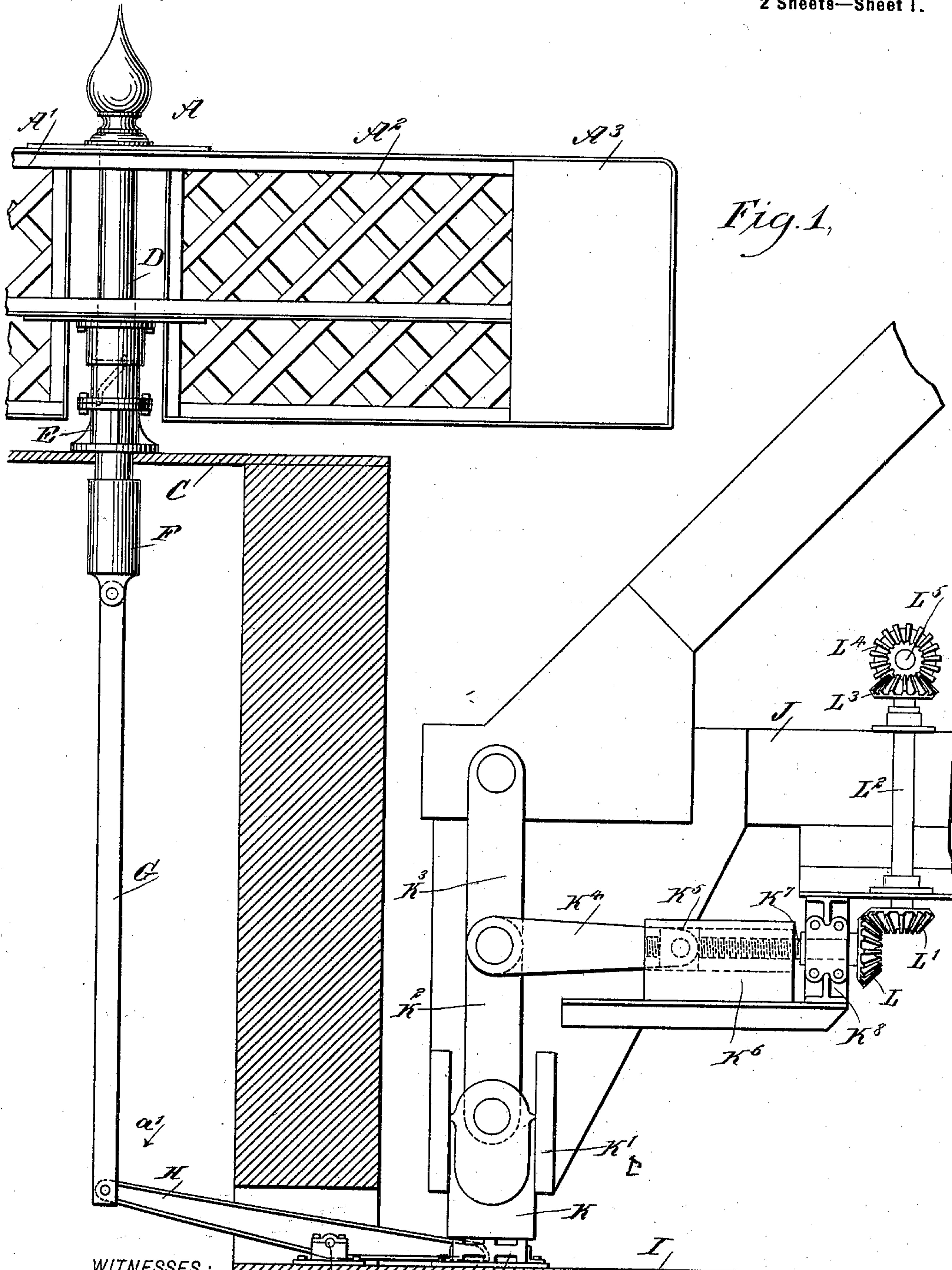
Patented June 13, 1899.

J. P. COWING.
GATE FOR DRAWBRIDGES.

(Application filed Feb. 21, 1899.)

2 Sheets—Sheet 1.

(No Model.)



WITNESSES:

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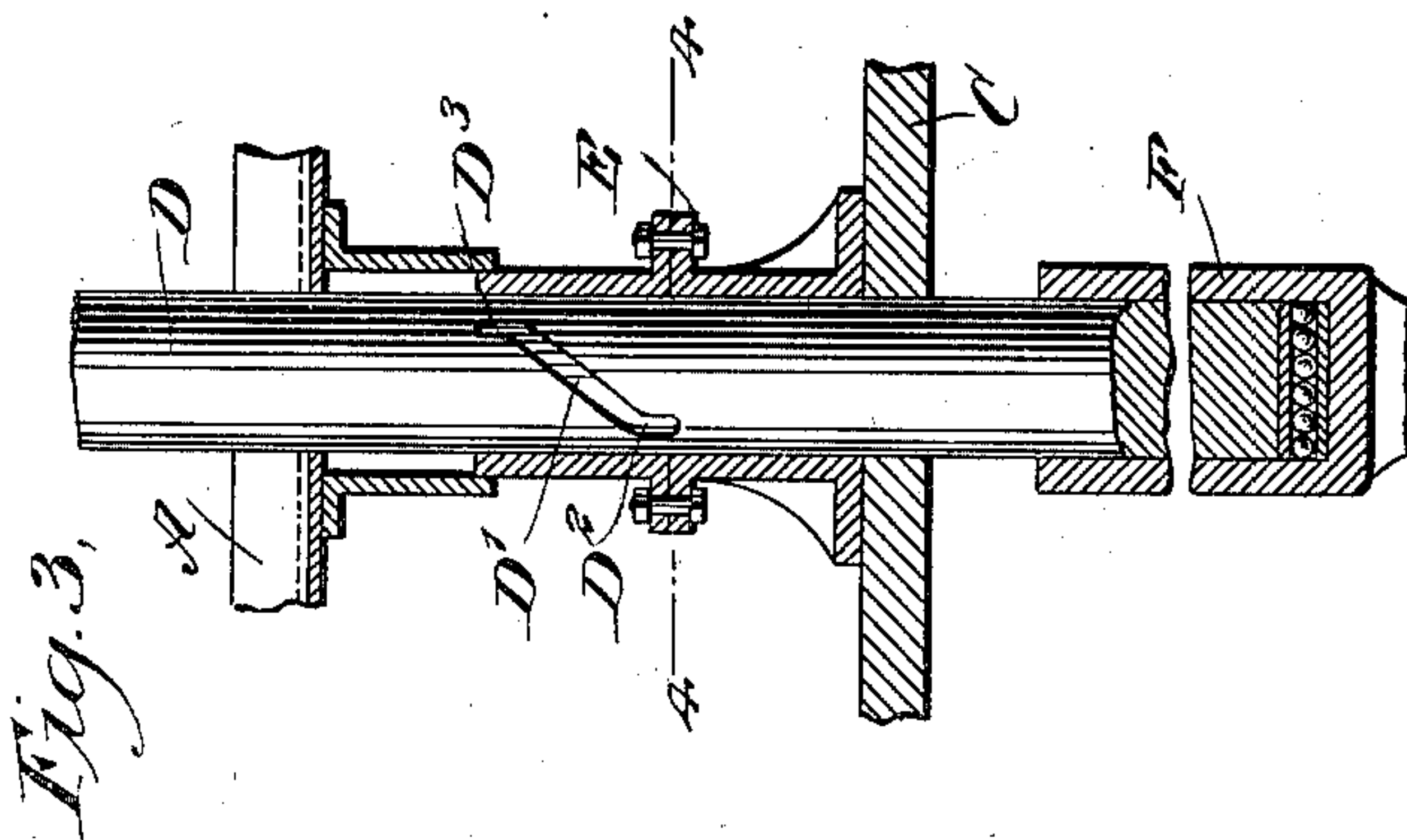
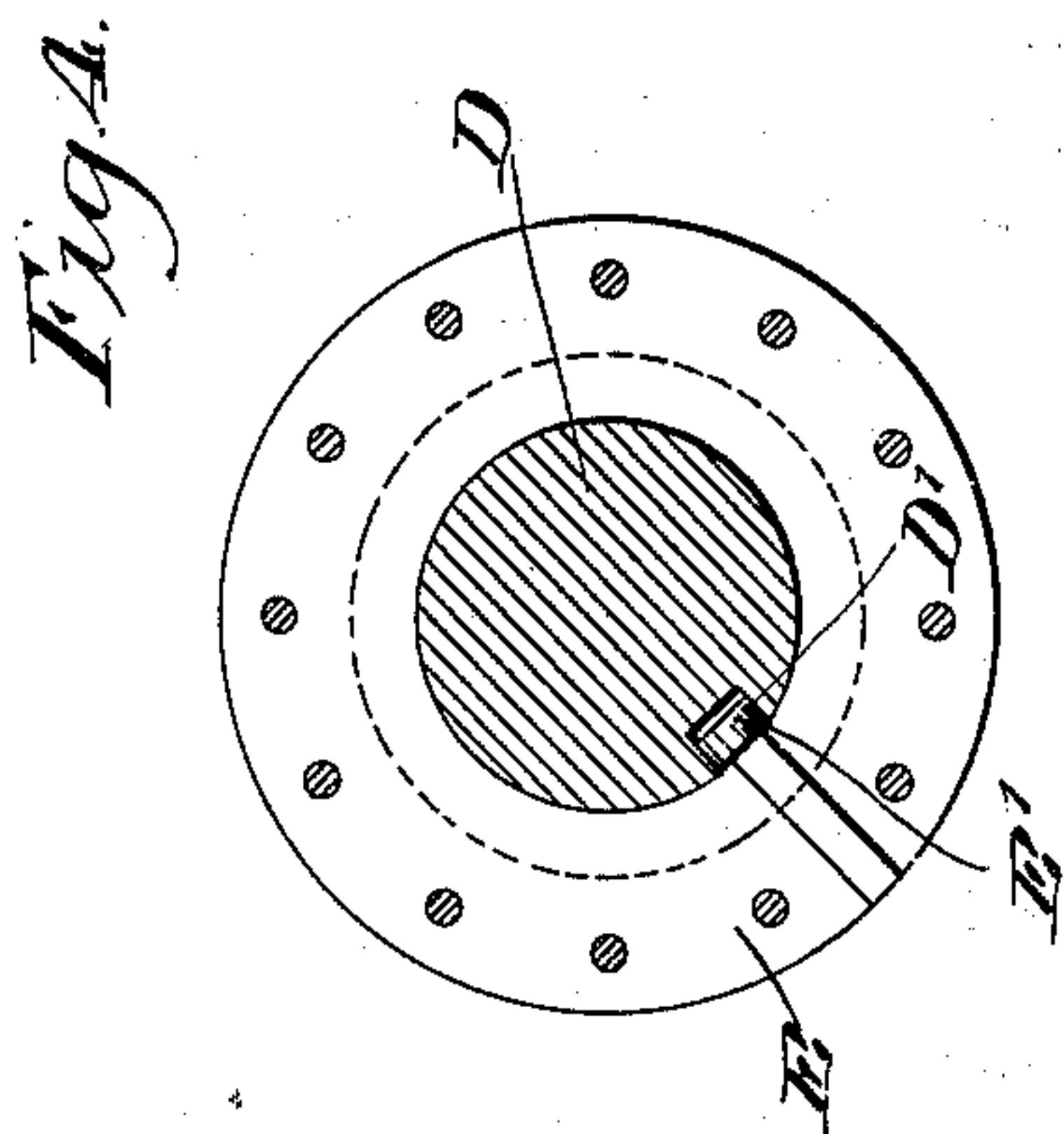
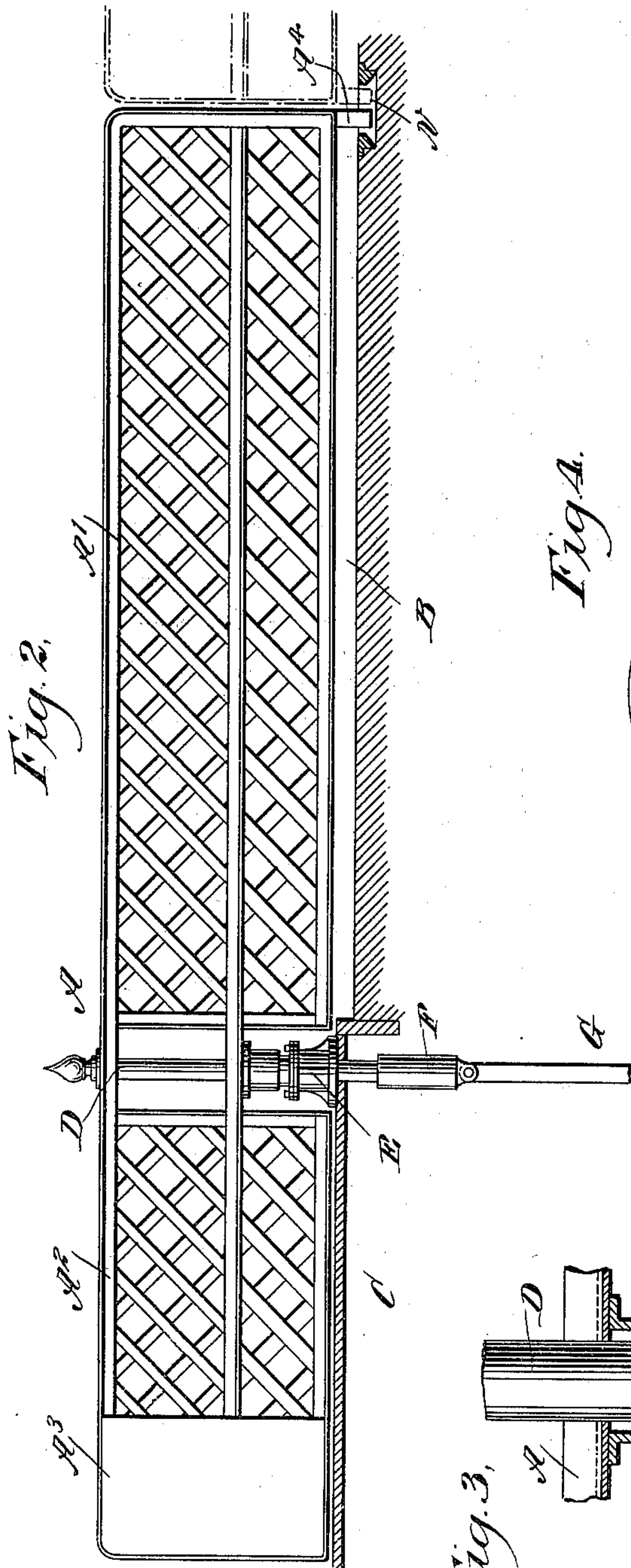
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WITNESSES:

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GATE FOR DRAWBRIDGES.

SPECIFICATION forming part of Letters Patent No. 626,970, dated June 13, 1899.

Application filed February 21, 1899. Serial No. 706,320. (No model.)

To all whom it may concern:

Be it known that I, JOHN PHILO. COWING, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Gates for Drawbridges, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved gate more especially designed for use on draw or swing bridges and arranged to be automatically closed and locked immediately previous to starting the bridge for opening the same and to automatically open the gate shortly after the bridge is closed.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of my invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement as applied, with parts in section. Fig. 2 is a reduced transverse section of the same with the gate in a closed position. Fig. 3 is an enlarged sectional side elevation of the gate-post and its bearing, and Fig. 4 is an enlarged sectional plan view of the same on the line 4 4 in Fig. 3.

The gate A illustrated in the drawings is provided with a roadway-section A' for extending over the whole or half of the roadway B to close the same and a sidewalk-section A², adapted to extend over the sidewalk C, a weight A³ being on the outer end of the section A² for counterbalancing the longer roadway-section A'.

The gate A between the sections A' and A² is secured on a shaft D, mounted to turn and to slide in a bearing E, attached to the sidewalk C, and the lower end of this shaft is set in a step F, pivotally connected at its lower end by a link G with a lever H, fulcrumed at H' on a masonry pier or abutment I, the lever being operated in one direction by a suitable mechanism carried by the draw or swing bridge J, as is plainly shown in Fig. 1, the said mechanism operating by means of jacks, latches, rail-splices, lifts, or other devices forming part of the drawbridge mechanism,

so that the lever H is actuated immediately previous to opening the drawbridge or immediately after the drawbridge is closed, as hereinafter more fully described.

The bearing E carries a friction-roller E', engaging a spiral groove D', formed in the shaft D, so that when the lever H is swung in the direction of the arrow a', as shown in Fig. 1, then the link G and the step F, in which the lower end of the shaft D is mounted, are caused to move downward to allow the weight of the gate A to move the shaft D in the same direction by the gravity of the gate, and in doing so a turning motion is given to the gate, owing to the shaft turning, by the spiral groove D' traveling on the roller E'. The gate A then swings into a closed position, as shown in Fig. 2, and a post A⁴ on the outer end of the section A' drops into a keeper N, arranged in the roadway, to lock the gate against accidental opening. The other section A² swings across the sidewalk C, so that both the roadway B and the sidewalk are closed to traffic and passengers.

The groove D' terminates at the bottom and top in straight vertical portions D² and D³, so that the gate moves vertically before it begins to swing or comes to a rest, and when the upper end D³ of the groove engages the roller E' then an additional locking of the gate takes place, as the shaft D cannot now turn. In a like manner the shaft D cannot turn when the friction-roller is in the lower end D² of the groove, and consequently the gate stands in an open position and does not commence to swing until shortly after a swinging motion is given to the lever H.

It is understood that when the lever H is caused to swing in the inverse direction of the arrow a' then the link G and the step F move upward and lift the shaft, so that the gate is first lifted straight up to remove the post A⁴ out of the keeper N, and then the gate is turned by the action of the roller E' and groove D' in the shaft D to swing the gate back into an open position, and then the gate is lowered straight down for the post A⁴ to engage another keeper N, and the roadway B, as well as the sidewalk C, is then again opened to traffic. It is further understood that when the gate A is in a closed position, as shown in Fig. 2, the roller E' is in the upper end D³

of the spiral groove, and when the gate is opened said roller is in the lower end D^2 of the groove.

The lever H extends with its free end into the path of the toggle-head K of a toggle jack-screw mechanism carried by the draw or swing bridge J, and the said toggle-head K is mounted to slide in vertical guideways K' , carried on the bridge below the flooring, and the head is connected with an upwardly-extending toggle-link K^2 , pivoted on a toggle-link K^3 , fulcrumed at its upper end on the bridge-frame, and the two links are pivotally connected by a toggle K^4 with a nut K^5 , fitted to slide in horizontal guideways K^6 , fixed to the bridge. In the nut K^5 screws a jack-screw K^7 , mounted to turn in bearings K^8 , fixed to the bridge, and on the screw is secured a beveled pinion L in mesh with a beveled pinion L' on the lower end of a vertical shaft L^2 , connected at its upper end by beveled gear-wheels L^3 and L^4 with a transverse shaft L^5 , driven from a suitable motor or engine which is usually placed over the center of the bridge, and a clutch is arranged in the connection between the motor and the shaft L^5 .

The mechanism above described is usually employed on draw and swing bridges and serves to close the toggle and bring the toggle-head K in engagement with the base-casting I' at the time the bridge is moved into a closed position to properly support the ends of the bridge from the solid masonry pier or abutment I. When it is desired to open the bridge, the motor is reversed to open the toggle and move the head K upward out of engagement with the base-casting I' to free the ends of the bridge and to then permit of swinging the bridge into an open position. The free end of the lever H extends into the path of the head K, so that when the head moves downward it moves in contact with the said lever end and imparts a swinging motion to the lever in the inverse direction of the arrow α' until the free end of the lever rests in a recess in the base-casting I' and the toggle-head K engages the said casting in the usual manner and for the purpose above described. When the head K slides upward previous to opening the bridge, the lever H by its own weight and that of the link G, shaft D, and gate A is caused to swing in the direction of the arrow α' to bring the free end of the lever into an uppermost position for engagement by the head K on its next downward movement. Thus the lever H is actuated immediately previous to opening the bridge or immediately after the bridge is closed. It is understood that usually two such jack-screw mechanisms are on each end of the bridge to operate two levers H for two gates simultaneously. I have shown and described one form of jack-screw mechanism used for supporting the ends of the bridge on the pier and for actuating the lever H; but it is evident that other constructions may be employed to accomplish the same end. For instance,

some bridges are provided with wedges screwing under each corner of the bridge, and other jack-screws consist of a cam arrangement which when thrown into position wedges up the ends of the bridge. The gate can also be operated by the mechanisms of rail locks or lifts, sometimes used on swing-bridges to connect and disconnect railroad-rails on bridges where rails are used. The gate can also be actuated from a latch device frequently employed on swing-bridges to latch the bridge in position, and, if desired, the gate may be operated by an independent mechanism to force down the free end of the lever H. It is understood that in either case the gate is operated automatically upon releasing the lever H, and the gate is specially intended to be closed and locked across the roadway before the bridge commences to swing into an open position and is not to be opened until after the bridge is again closed and the lever depressed at its free end.

As shown in the drawings, a counterbalanced gate for both the roadway and sidewalk is provided; but it is evident that the improvement can be used on gates of different construction and arranged for different purposes.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A bridge-gate comprising a gate proper, a shaft carrying the gate and mounted to slide and to turn, and mechanism operating in conjunction with the opening and closing of the bridge, to impart an upward sliding motion to the said shaft after the closing movement of the bridge is completed, to cause the shaft to turn in its bearing and move the gate into an open position, the shaft when released by the said mechanism sliding and turning back to its former position by its own gravity, to move the gate across the roadway and close the same prior to the opening movement of the bridge, substantially as shown and described.

2. In a drawbridge-gate, the combination of a shaft mounted to slide and to turn, a gate carried by the shaft, a pivoted lever, a connection between the shaft and lever, and mechanism on the bridge for automatically operating the said lever prior to the opening movement of the bridge and after the closing movement thereof is completed, substantially as described.

3. In a drawbridge-gate, the combination of a bearing provided with an inwardly-extending projection, a shaft mounted in the bearing and provided with a spiral groove terminating at its ends in straight vertical portions and in which works the projection of the bearing, a gate carried by the shaft, a step in which is set the lower end of the shaft, a pivoted lever, a link connecting the step with one end of the lever, and means for operating the lever from a drawbridge, substantially as described.

4. In a drawbridge, the combination of a shaft mounted to slide and turn, a gate carried by the shaft, a step receiving the lower end of the shaft, a pivoted lever having one end extending into the path of a movable part of a drawbridge-operating mechanism, and a link connecting the other end of the lever with the step, substantially as described.

5. A bridge-gate, comprising a gate having a shaft mounted to turn and to slide in fixed bearings, a spiral groove in said shaft, said groove having straight vertical end portions, a friction-roller journaled in said bearing and engaging said groove, means for imparting a sliding motion to said shaft from the operating mechanism of the drawbridge, and a

fixed keeper adapted to be engaged by a post on the gate, to lock the gate in a closed position, substantially as shown and described.

6. The combination with a toggle-head of a toggle jack-screw mechanism for operating a drawbridge, of a shaft mounted to slide and turn, a gate carried by the shaft, a step receiving the lower end of the shaft, a lever having one end extending beneath the said toggle-head, and a link secured to the other end of the lever and to the step, substantially as described.

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Witnesses:

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A. H. PORTER.