

(No Model.)

F. G. WHITE.
SWINGING BRIDGE FENDER.

No. 366,053.

Patented July 5, 1887.

Fig. 1.

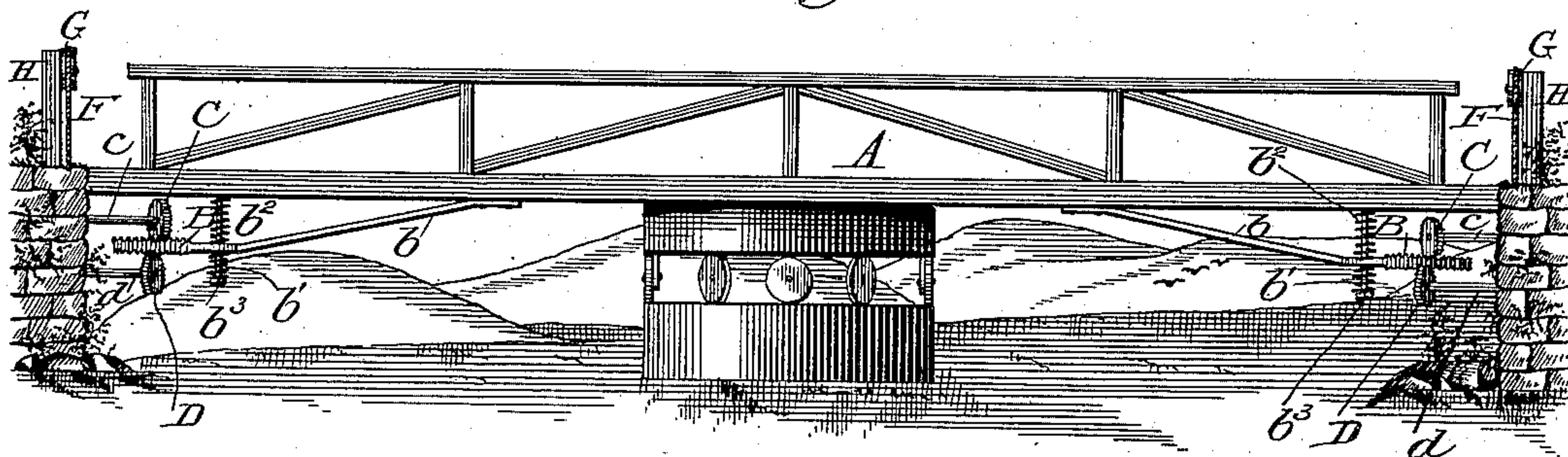


Fig. 2.

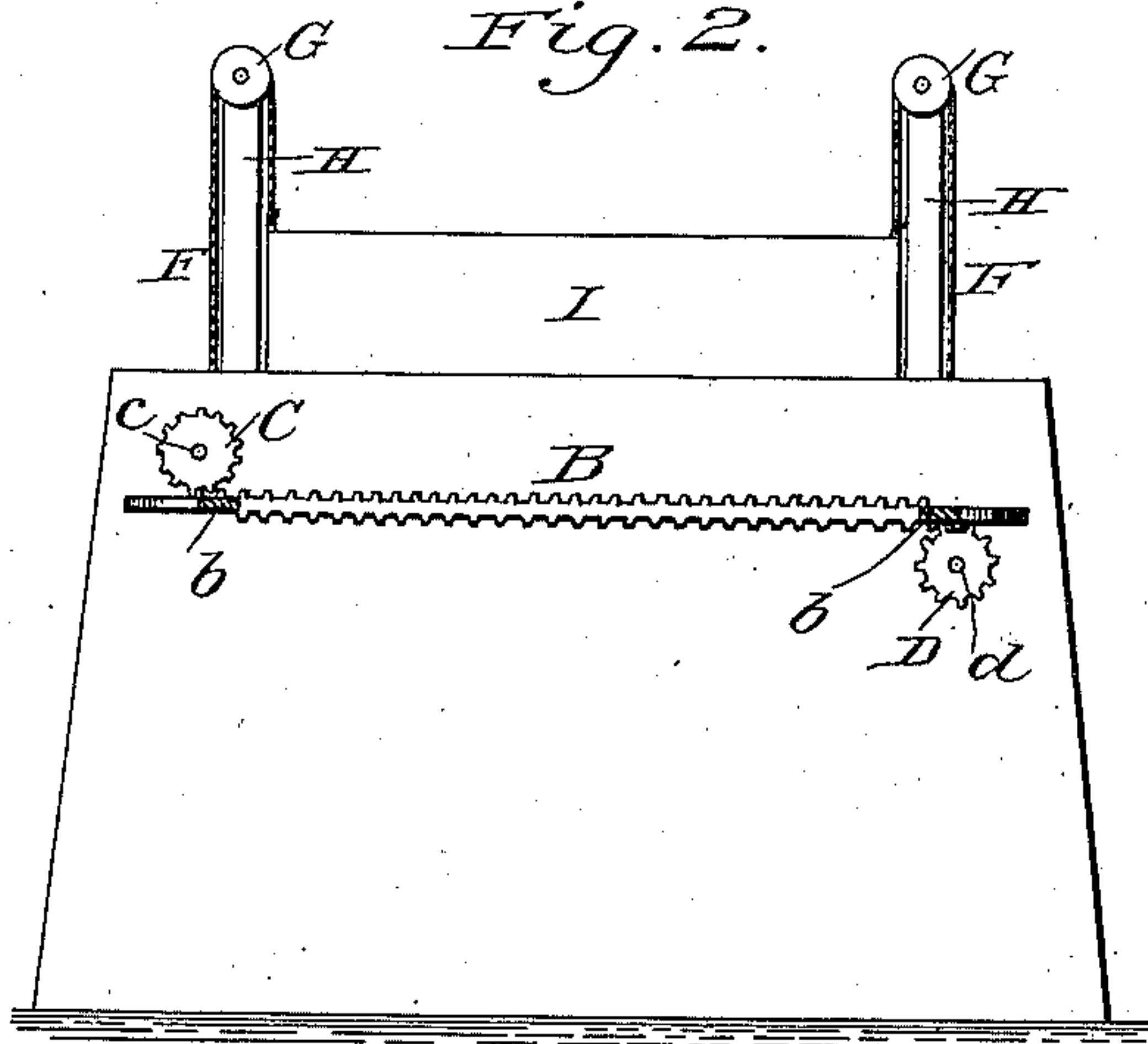


Fig. 3.

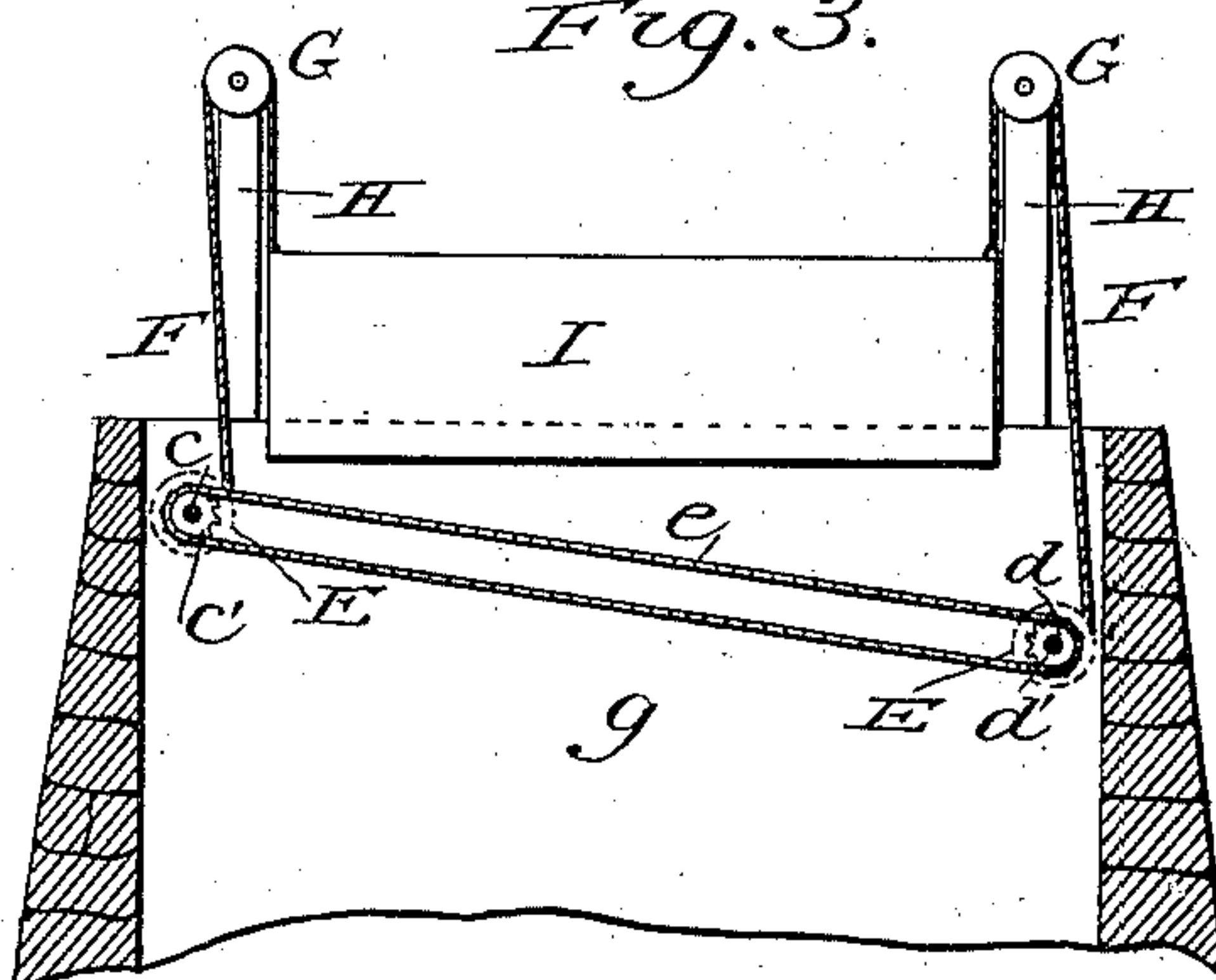


Fig. 5.

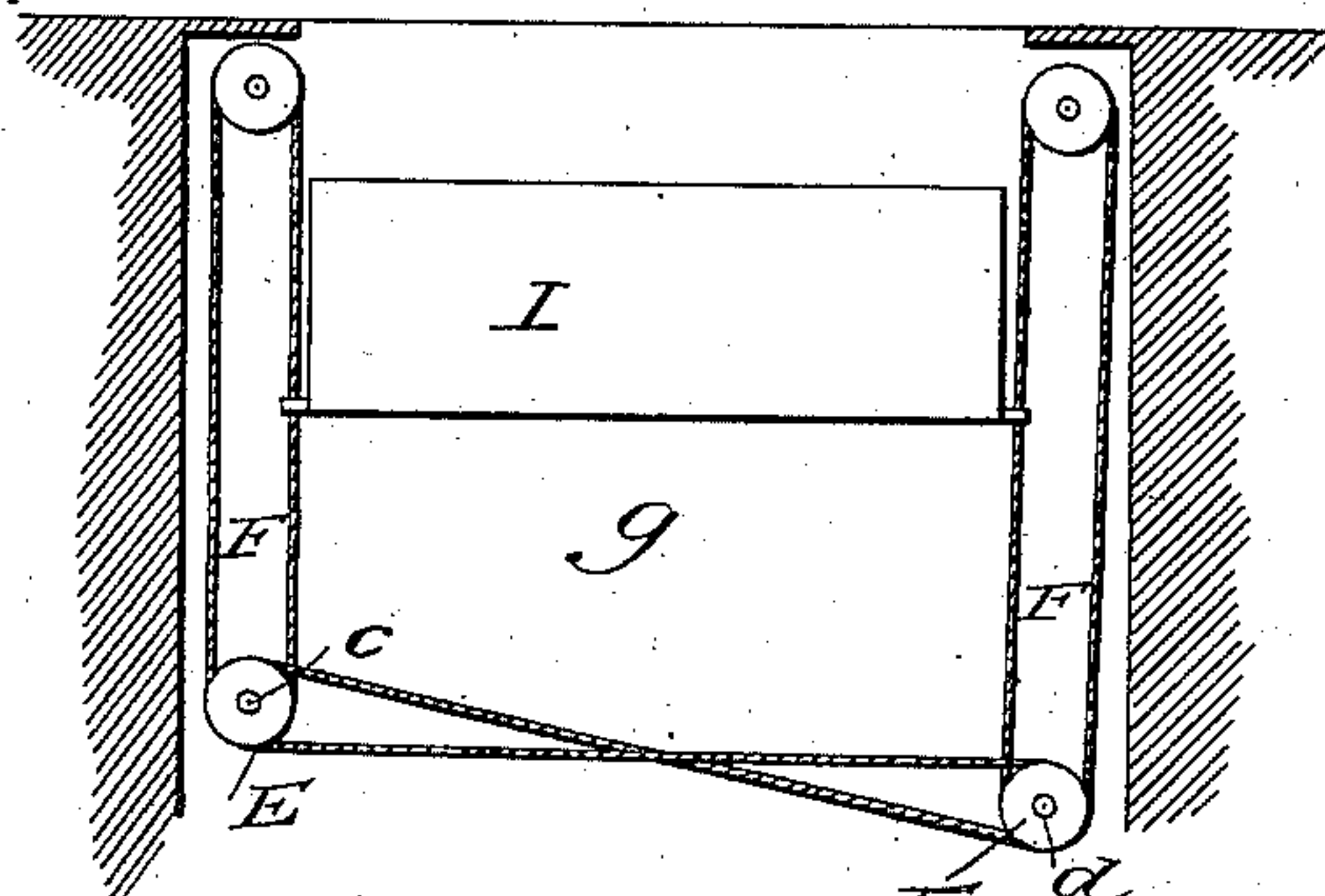
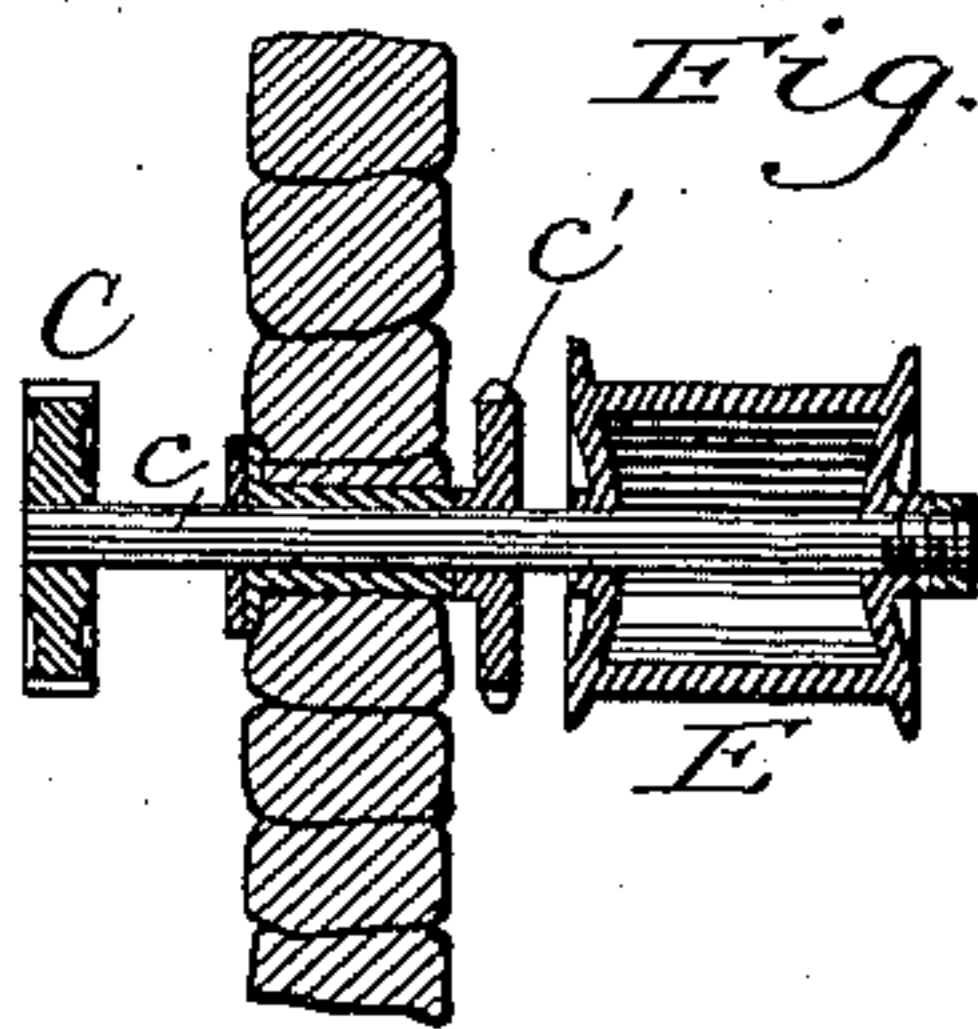


Fig. 4.



Witnesses:

Louis Braunhold.

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UNITED STATES PATENT OFFICE.

FRANK G. WHITE, OF SOUTH CHICAGO, ILLINOIS, ASSIGNOR OF TWO-THIRDS TO MICHAEL McINERNEY, OF SAME PLACE.

SWINGING-BRIDGE FENDER.

SPECIFICATION forming part of Letters Patent No. 366,053, dated July 5, 1887.

Application filed June 25, 1885. Renewed April 23, 1887. Serial No. 235,937. (No model.)

To all whom it may concern:

Be it known that I, FRANK G. WHITE, of South Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Swinging-Bridge Fenders; and I do hereby declare that the following is a full, clear, and exact description of the invention, which 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 letters of reference marked thereon, which form a part of this specification.

My invention relates to bridge-fenders which automatically close the approach to swinging bridges when the same is open, and open said approach when the bridge is closed.

In the drawings, Figure 1 is a side elevation of my invention. Fig. 2 is a front elevation of the abutment of the bridge-approach. Fig. 3 is a transverse vertical section of bridge-approach. Fig. 4 is a detail view showing one of the drums and pinions in section. Fig. 5 shows a modification.

Reference being had to the drawings, A represents a swinging bridge of the usual construction, the ends of which are curved to correspond to a segment of a circle struck from the pivotal center of said bridge. Arranged underneath these ends and supported by arms $b\ b$, connected at their inner ends nearer the center of the bridge, are the racks B B. These racks describe a segment of a circle similar to the ends of a bridge under which they are placed, and are provided with a series of cogs on both the upper and under surfaces. Depending from the under surface of the bridge are the vertical rods $b' b'$, which pass downward through suitable openings in the arms $b\ b$, near where they connect with the racks B, and have surrounding them immediately above and below said arms the stiff springs $b^2 b^2$, the pressure of which against the arms is regulated by the nuts b^3 . The cogs on the upper surface of the racks B mesh with pinion C, fast on shaft c , projecting and journaled in suitable bearings in the abutments of the bridge-approach diagonally opposite each other and on a line radiating from the pivotal center of the bridge. The cogs on the under surface of said racks B mesh with the pinion D, fast on the end of shaft d , journaled on a plane below said

rack in the corner of the abutment of the bridge-approach, next to and on the same side as pinion C. Pinion D is on a plane below that of pinion C, and the two are so arranged that the rack as it travels from right to left will alternately engage pinions C C, driving them in one direction, and then pinions D D, driving them in the opposite direction, or vice versa. The shafts of these pinions C and D extend horizontally through the abutments of the bridge-approach to a chamber under the road approaching the bridge, where, contiguous to said abutment, they are provided with concave pulley or sprocket wheels $c' d'$, which are connected by means of a rope, cable, or chain, e . On the inner ends of these shafts c and d , contiguous to the pulleys c' and d' , are drums E, having the ropes or chains F wound around them from right to left, so that as said drums revolve from left to right they unwind or pay out the rope, and when they have the contrary motion wind or haul it in. These ropes F, after they leave the drums, pursue an upward course through the road-bed to the pulleys G, journaled in the vertical posts H, after passing or being wound around which they travel downward and are connected in a suitable manner to the gates I. These gates are placed transversely across the road leading to the bridge, and when the bridge is closed rest in a suitable chamber, g , of corresponding dimensions, which is below the road-bed, and when lifted out therefrom through the transverse opening thereof close the approach to the bridge.

In operation my invention works substantially as follows: Say the swinging bridge is closed and it is desired to open it. Now, as the bridge moves to the right the cogs on the upper surface of the rack will engage with pinion C, which derives a motion therefrom from right to left, which it imparts to the drum E on the same shaft, and thus winds the rope F and lifts that end of the gate. The motion thus acquired by pinion C will be imparted to pinions D by the rope belt e , and will cause the rope F to wind around the drum on shaft d , thus lifting both ends of the gate simultaneously and at the same rate of speed. If the bridge is swinging into place from right to left, the motion of the pinion C would be the reverse of that just described, causing the rope to unwind from the drum, thus lowering the gate.

It makes no difference in what direction the bridge is moving when being opened or closed. The gate will be lifted to close the approach to the bridge when said bridge is opened, and
 5 will be lowered to open said approach when the bridge is closed. If desired, considerable friction can be overcome by weighting the ropes F between the pulleys G and c' and G d' , so as to counterbalance to a certain extent
 10 the weight of the gate. Moreover, a friction-roller may be placed on the same vertical plane above pinion D and one on the same vertical plane below pinion C, both of which have, preferably, rubber tires, and are separated from
 15 said pinions the thickness of said racks. These friction-rollers are adapted to keep the racks in engagement with pinions C and D when the bridge is moving.

By reference to Fig. 5 it will be seen how the
 20 gate may be lifted without exposing the ropes F above the road-bed. This I accomplish by bringing the pulleys G down below the surface of the road-bed in a suitable chamber and connecting them by means of a belt or endless
 25 chain, and then connecting the lower corners of the gate to the said belts in such manner that they will lift the gate at the same speed at the same time. In case this modification is used the rest of the actuating mechanism remains
 30 the same.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an automatic bridge-fender, the swinging bridge, double racks B, arranged under
 35 the ends of said bridge, arms b , and rods b' , sup-

porting said racks, in combination with pinions C and D, alternately engaged by said racks B, shafts c and d , suitably connected, drums E, ropes F, and gate G, substantially
 40 as hereinbefore specified.

2. The combination, with the swinging bridge, and the racks arranged under the ends thereof, of the pinions C and D, arranged, respectively, above and below the horizontal
 45 plane of said racks and engaged, respectively, by the cogs on the upper and under surfaces thereof, the shafts c and d , carrying said pinions, the pulleys c' and d' thereon, and cable
 50 e , connecting the same, the drums E, ropes F, pulleys G, upright posts H, having bearings for pulleys G, and gates I, said ropes F being preferably weighted between pulleys c' and G and d' and G, respectively, as and for the purpose set forth.

3. The combination of the racks arranged
 55 under the ends of a swinging bridge, arms supporting said racks, which are nearer the center of the bridge, vertical rods depending from said bridge and passing through suitable
 60 openings in said arms, and springs surrounding said rods above and below said arms, the pressure whereof against said arms is regulated by nuts, substantially as described.

In testimony that I claim the foregoing as my own I hereunto affix my signature in presence of two witnesses.

FRANK G. WHITE.

Witnesses:

JNO. W. SICKELS,

FRANK D. THOMASON.