

(No Model.)

2 Sheets—Sheet 1.

W. THEIS.
BRIDGE GUARD.

No. 436,570.

Patented Sept. 16, 1890.

Fig. 1.

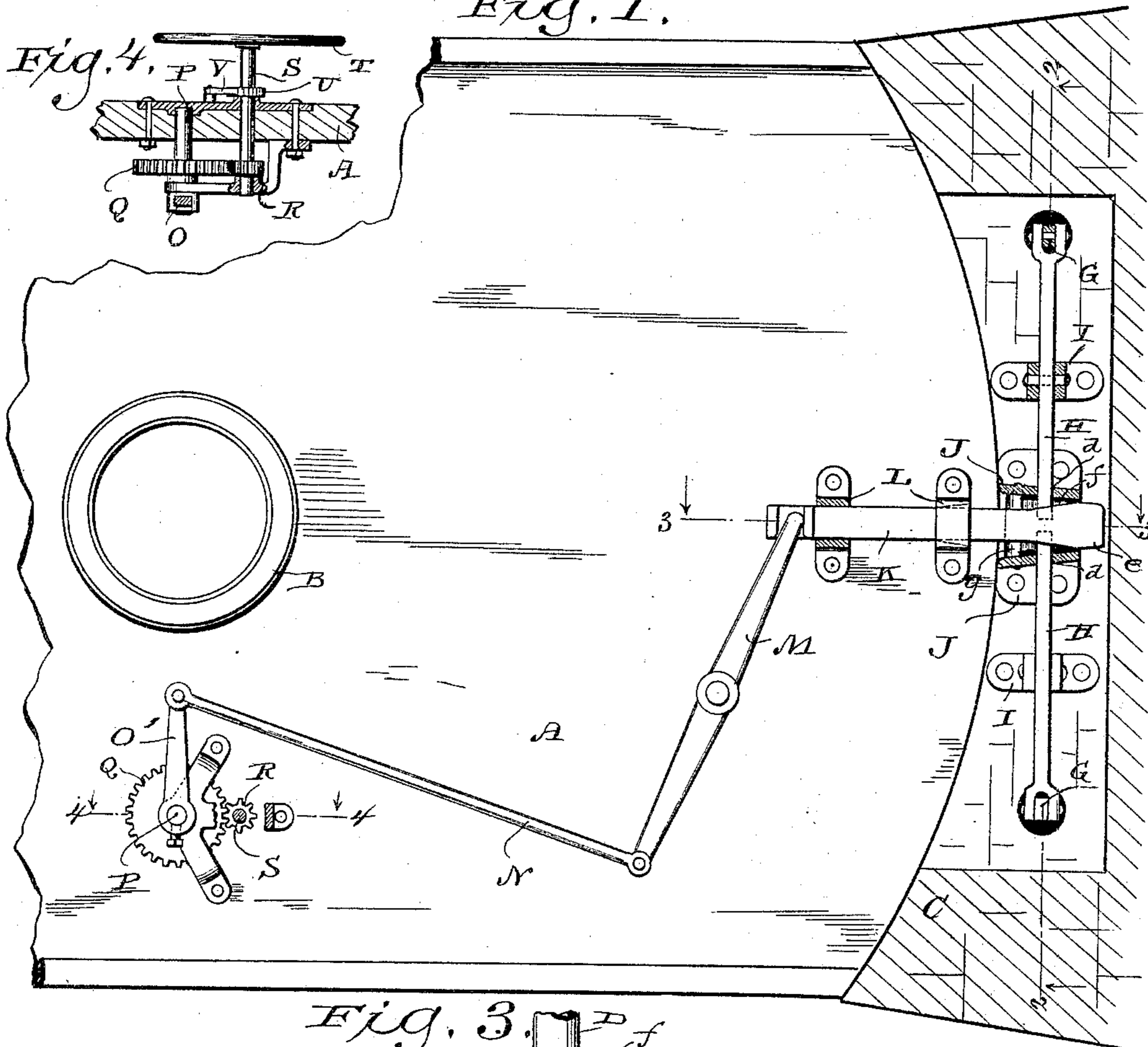
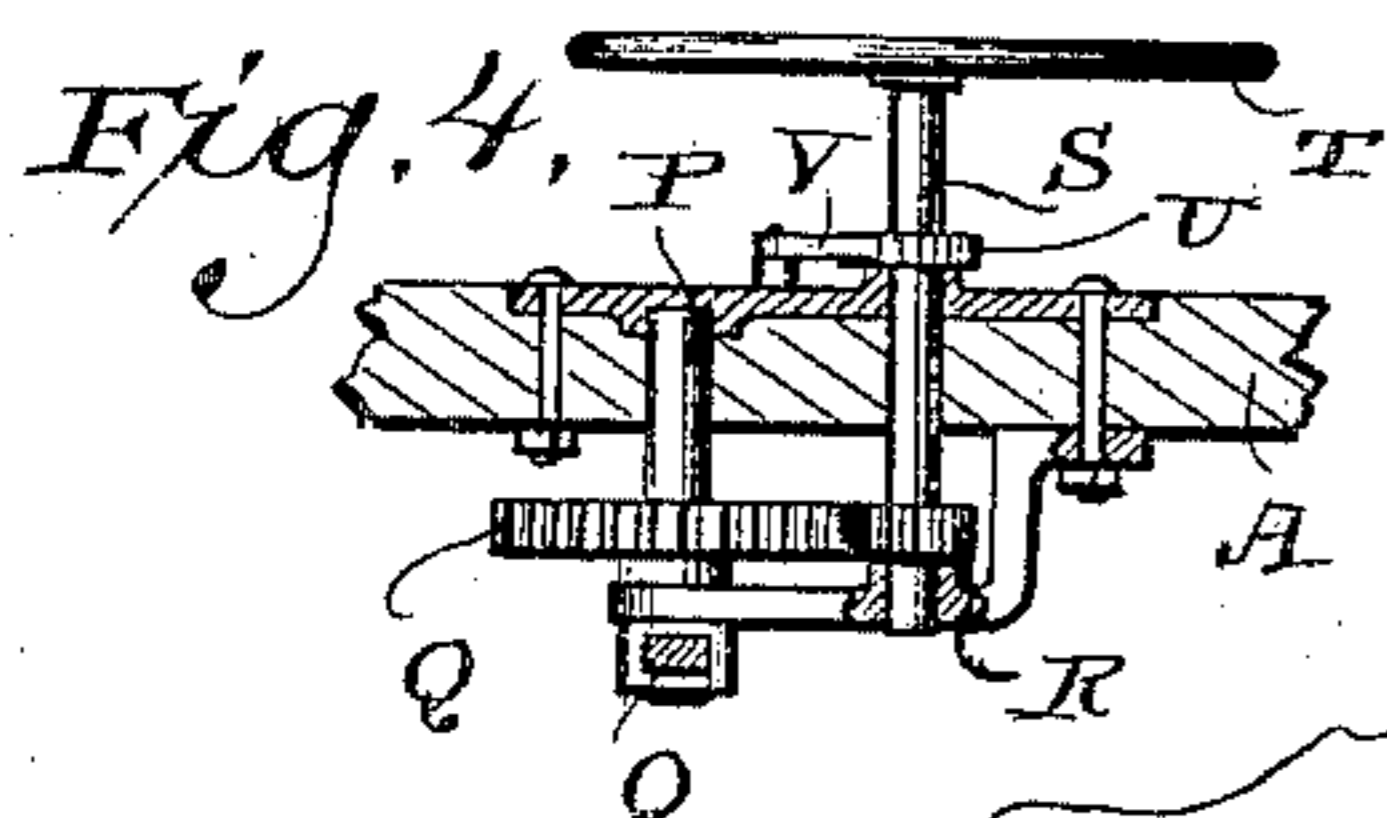


Fig. 3.

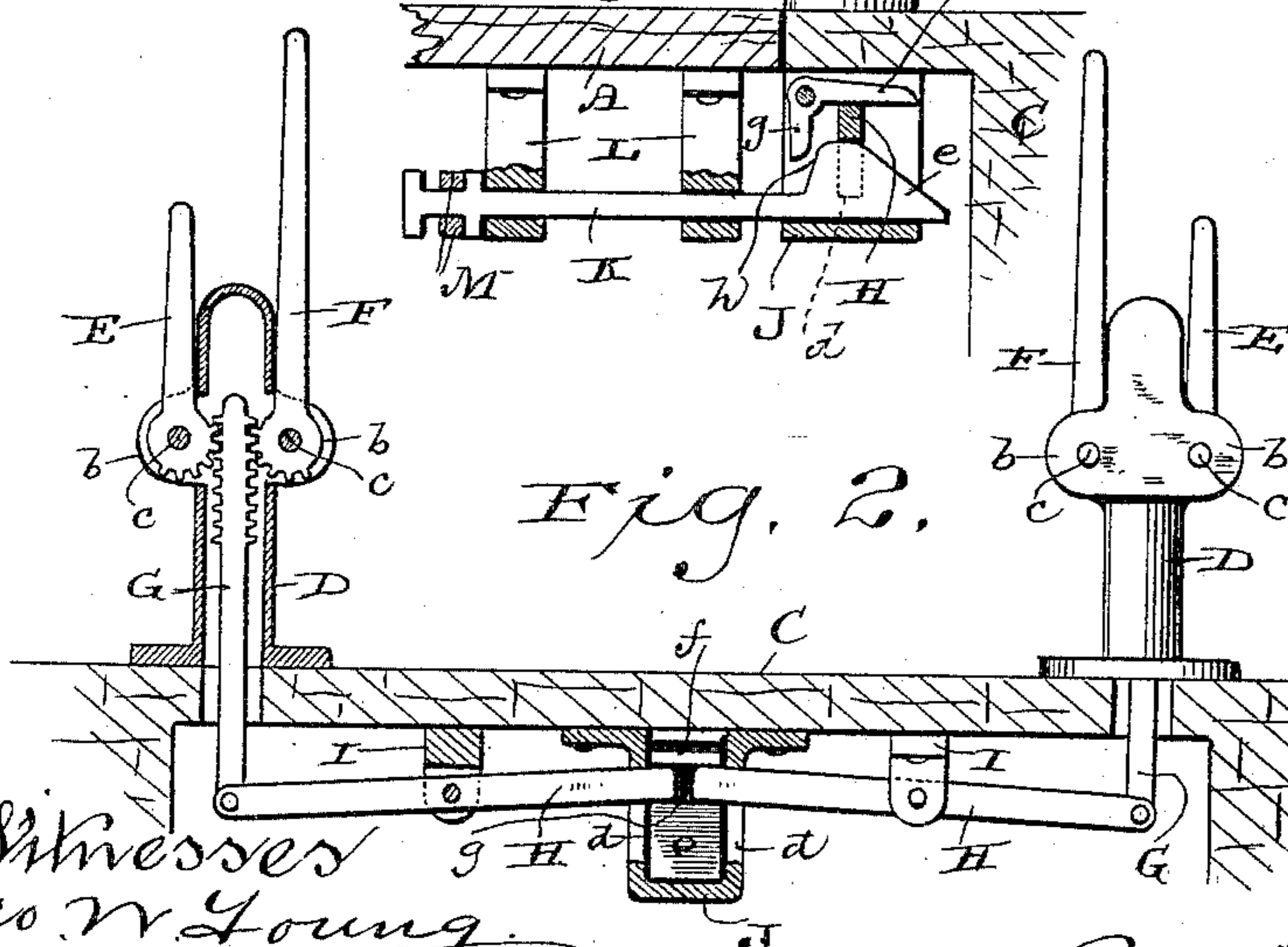


Fig. 2.

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2 Sheets—Sheet 2.

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Fug. 5.

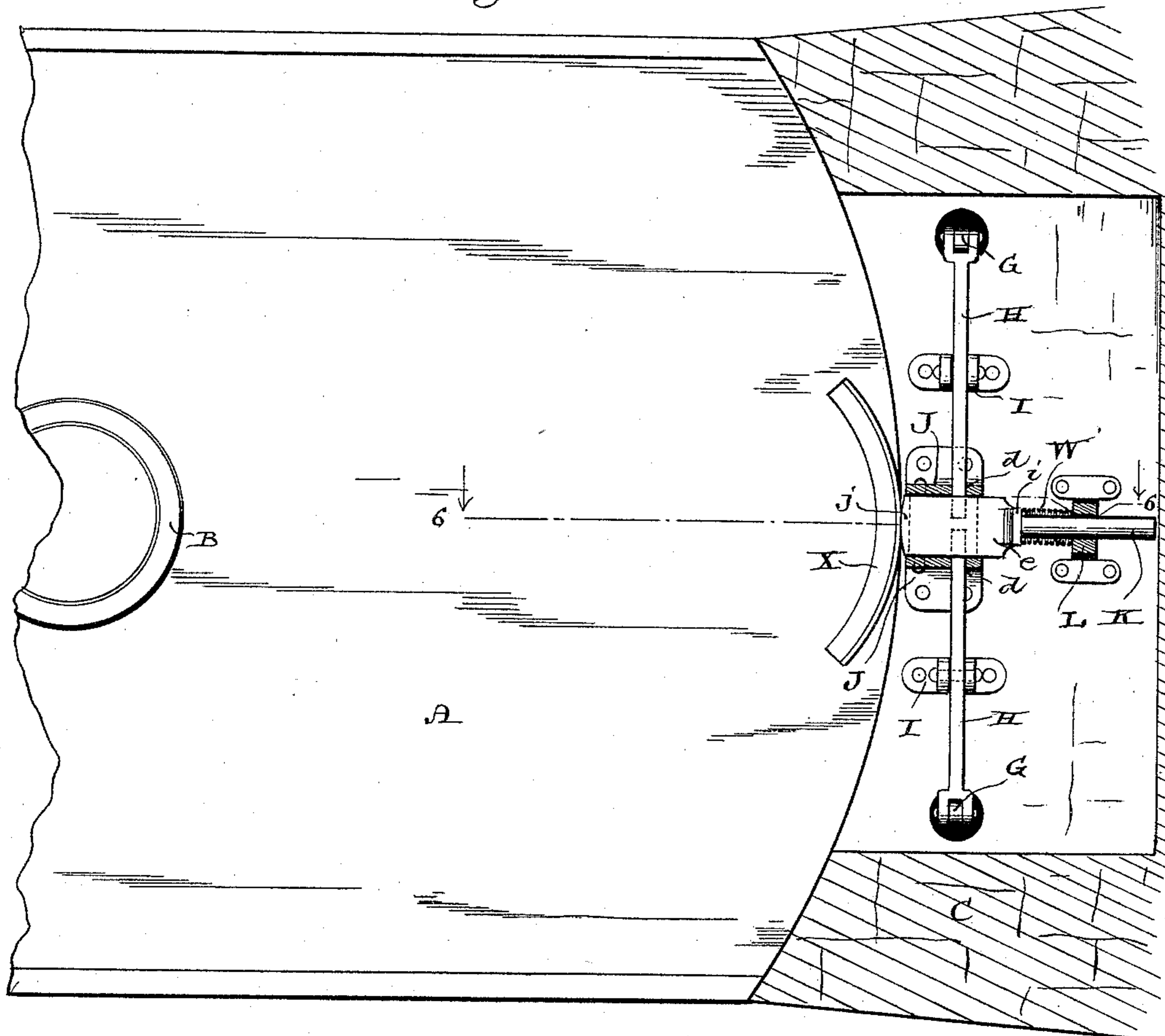


Fig. 6.

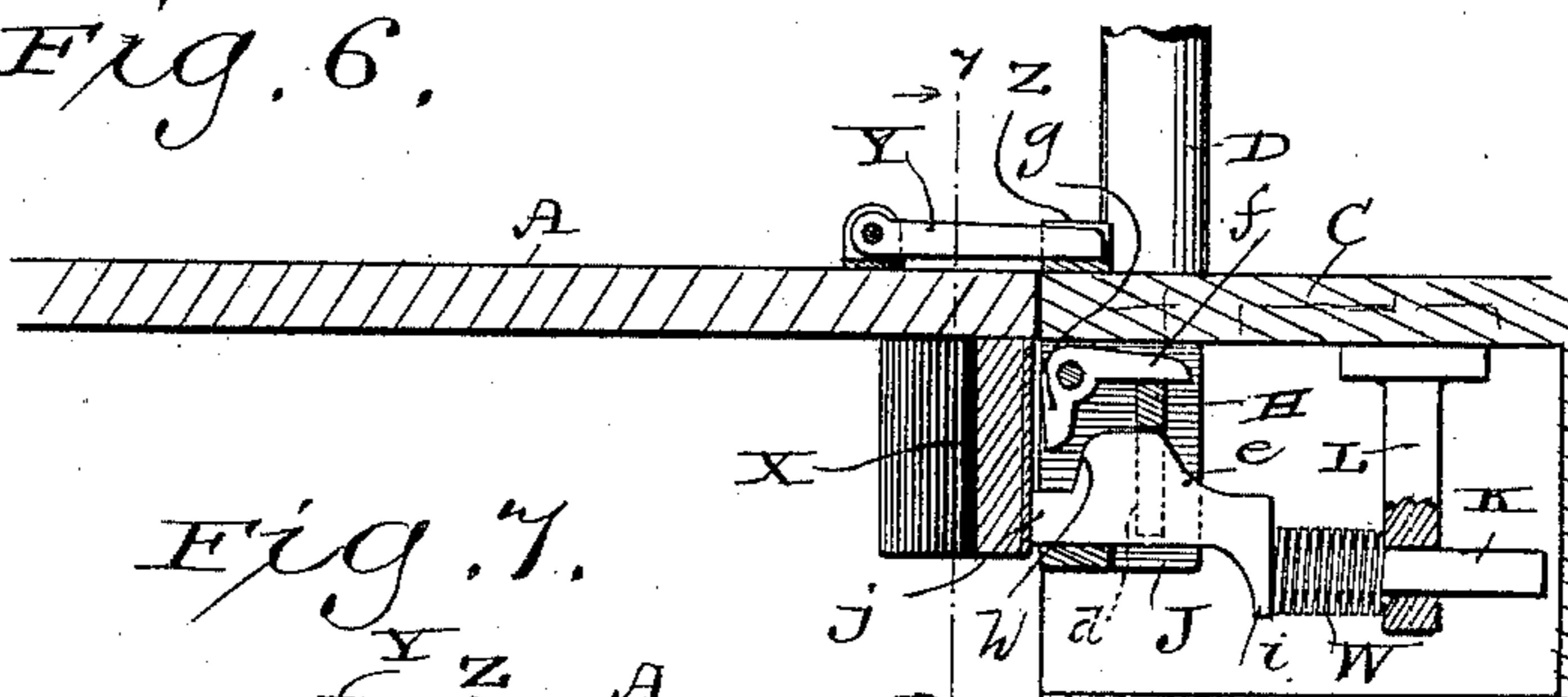
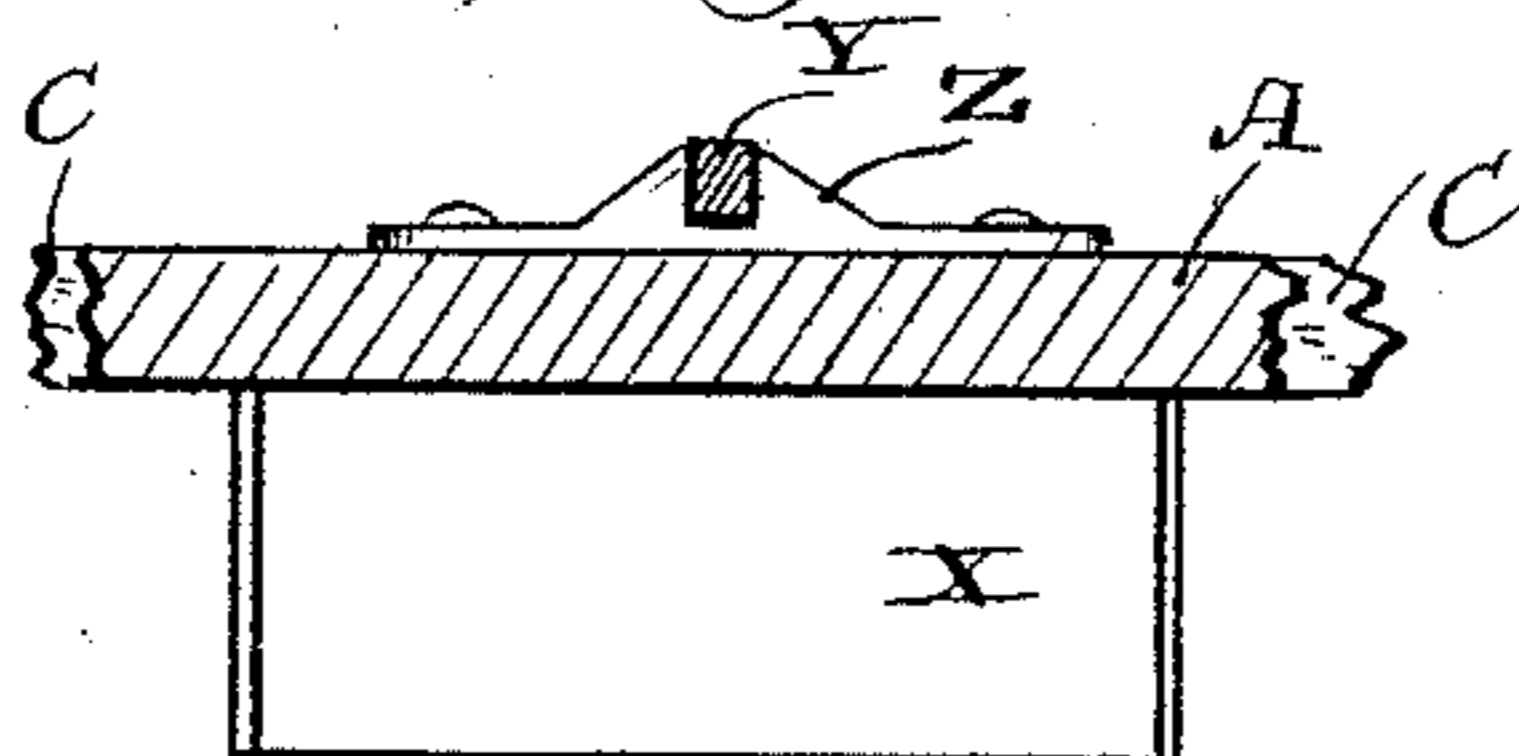


Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM THEIS, OF MILWAUKEE, WISCONSIN.

BRIDGE-GUARD.

SPECIFICATION forming part of Letters Patent No. 436,570, dated September 16, 1890.

Application filed June 23, 1890. Serial No. 356,401. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM THEIS, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Bridge-Guards; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to bridge-guards; and it consists in certain peculiarities of construction and combination of parts to be hereinafter described with reference to the accompanying drawings, and subsequently claimed.

In the drawings, Figure 1 represents a plan view looking up, certain of the parts being broken away and in horizontal section. Figs. 2, 3, and 4 represent detail sectional views, respectively, taken on lines 2 2, 3 3, and 4 4 of Fig. 1. Fig. 5 represents a view similar to Fig. 1 of another form of my invention; Fig. 6, a detail sectional view taken on line 6 6 of Fig. 5; and Fig. 7, a similar view on line 7 7 of Fig. 6.

Referring by letter to the drawings, A represents a bridge mounted on a turn-table B, and C represents an abutment of the bridge.

Secured to the abutment are hollow standards D, provided with lateral extensions *b*, that form bearings for trunnions *c* on the inner ends of arms E F, these arms being normally in the vertical position shown in Fig. 2, but dropped across the sidewalks and roadway of the adjacent approach to the bridge when the latter is open, as will be hereinafter more fully described.

The trunnioned inner ends of the arms E F of each standard are provided with teeth for engagement with a vertical double rack G, and each rack is pivoted to a lever H, fulcrumed to a bracket I, that depends from the adjacent abutment of the bridge.

The inner ends of the levers H extend through slots *d* in a housing J, that depends from the center of the abutment C, and these inner ends of said levers normally rest upon the highest point of the beveled head *e* of a bolt K, the latter being arranged in guides L, secured to the under side of the bridge.

Trunnioned in the housing J is a bell-crank having one arm *f* thereof extended over the inner ends of the levers H, and the other arm

g of this bell-crank is normally opposed to a shoulder *h*, formed by the rise of the head *e* above the plane of the bolt-shank.

In that form of my invention shown by Figs. 1 to 4, inclusive, the shank of the bolt K is connected to a lever M, fulcrumed to the under side of the bridge and connected by toggle-links N O with a vertical stud P, that has its bearings on said bridge. The stud P is provided with a gear-wheel Q, in mesh with a pinion R on a vertical shaft S, that also has its bearings on the bridge and extends above the same, as best illustrated in Fig. 4. I have illustrated the shaft S as provided with a hand-wheel T and ratchet-wheel U, the latter being engaged by a detent V; but this ratchet-wheel and detent may be omitted and said shaft actuated by any suitable means without departing from the spirit of my invention.

The operation of the parts above described is as follows: The bridge being closed and the several parts in position, as illustrated by Figs. 1 to 3, inclusive, the shaft S is actuated by the bridge-tender to communicate motion to the lever M and thereby draw the bolt K, the shoulder *h* of the latter coming against the arm *g* of the bell-crank to tilt the same and thereby cause its other arm to draw on the inner ends of the levers H and thus actuate the racks G to cause the arms or guards E F to begin their travel to a horizontal position. The guards having been started from their normal or vertical position their own weight will cause them to continue the descent, and by the time they are stopped in a horizontal position the upward movement of the racks G will have brought the inner ends of the levers H into the path of the beveled head *e* of the bolt K and the bridge may be swung open. When the bridge comes home, the shaft S is turned in a direction reverse to that above described, and thus the lever M is actuated to shoot the bolt-head *e* into the housing J, and thereby impart motion to the levers H and racks G, whereby the guards E F are brought back to their normal position.

By the construction and operation above described it will be seen that the guards E F are actuated independent of any movement of the bridge; but, as it may be desirable to automatically lower said guards when the bridge starts to swing open and likewise raise

the same when said bridge is closed again, I will now proceed to describe that form of my invention shown in Figs. 5 to 7, inclusive.

In the latter form of my invention, the standards D, guards E F, racks G, levers H, housing J, the bell-crank, and bolt K are of the same general construction and relative arrangement, excepting that said bolt has its guide L arranged within the adjacent abutment instead of on the bridge. Arranged on the shank of the bolt, between the guide L and the shoulder *i*, formed by the rise or offset of the bolt-head *e*, is a spiral spring W, that is normally compressed by a cam X depending from the bridge and also normally impinging against an extension *j* of said bolt-head. The parts being in the position laterally described, the bridge is held closed by a pivoted dog Y thereon engaged by a recessed bracket Z on the adjacent abutment. Now if the bridge be opened, the cam X coming out of contact with the bolt K will permit the spring W to shoot said bolt against the arm *g* of the bell-crank, and thereby start the guards E F on their descent, the inner ends of the levers H dropping down on the lower portion of the bolt-head. When the bridge comes home, the cam X forces back the bolt K and compresses the spring W, while at the same time the rearward movement of the bolt-head raises the inner ends of the levers H, and thus the racks G are actuated to elevate the guards E F to their normal position.

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

1. The combination of a swinging bridge, a standard on an abutment of the bridge, a guard trunnioned to the standard and provided with teeth, a rack in mesh with the teeth, a lever connected to the rack, a bolt

having a beveled head opposed to the lever, and suitable means for actuating the bolt, substantially as set forth.

2. The combination of a swinging bridge, a standard on an abutment of the bridge, a guard trunnioned to the standard and provided with teeth, a rack in mesh with the teeth, a lever connected to the rack, a bolt having a beveled head opposed to the lever, a trunnioned bell-crank having one arm thereof opposed to said lever and the other arm normally opposed to the bolt-head, and suitable means for actuating the bolt, substantially as set forth.

3. The combination of a swinging bridge, a standard on an abutment of the bridge, a guard trunnioned to the standard and provided with teeth, a rack in mesh with the teeth, a depending housing, a lever connected to the rack and extended into the housing, a bolt having a beveled head opposed to the lever, and suitable means for actuating the bolt, substantially as set forth.

4. The combination of a swinging bridge, a standard on an abutment of the bridge, a guard trunnioned to the standard and provided with teeth, a rack in mesh with the teeth, a lever connected to the rack, a bolt having a beveled head opposed to the lever, another lever connected to the bolt, and a power-shaft geared to the latter lever, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

WILLIAM THEIS.

Witnesses:

N. E. OLIPHANT,
WM. KLUG.