

(No Model.)

2 Sheets—Sheet 1.

G. L. FUCHS.
AUTOMATIC WEIR.

No. 594,733.

Patented Nov. 30, 1897.

Fig 1.

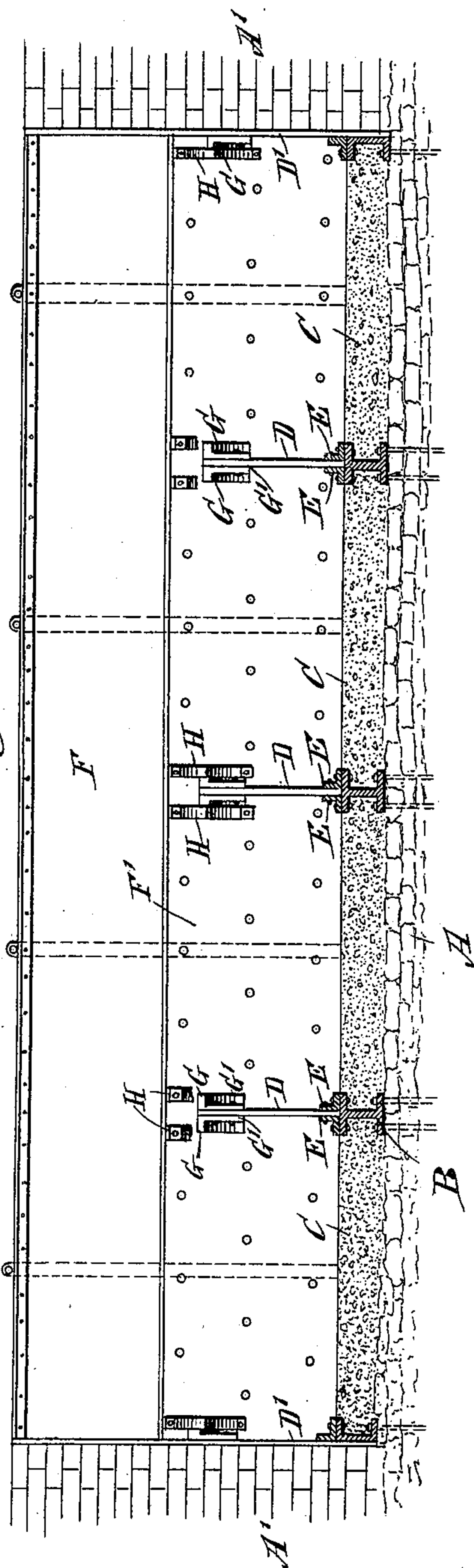
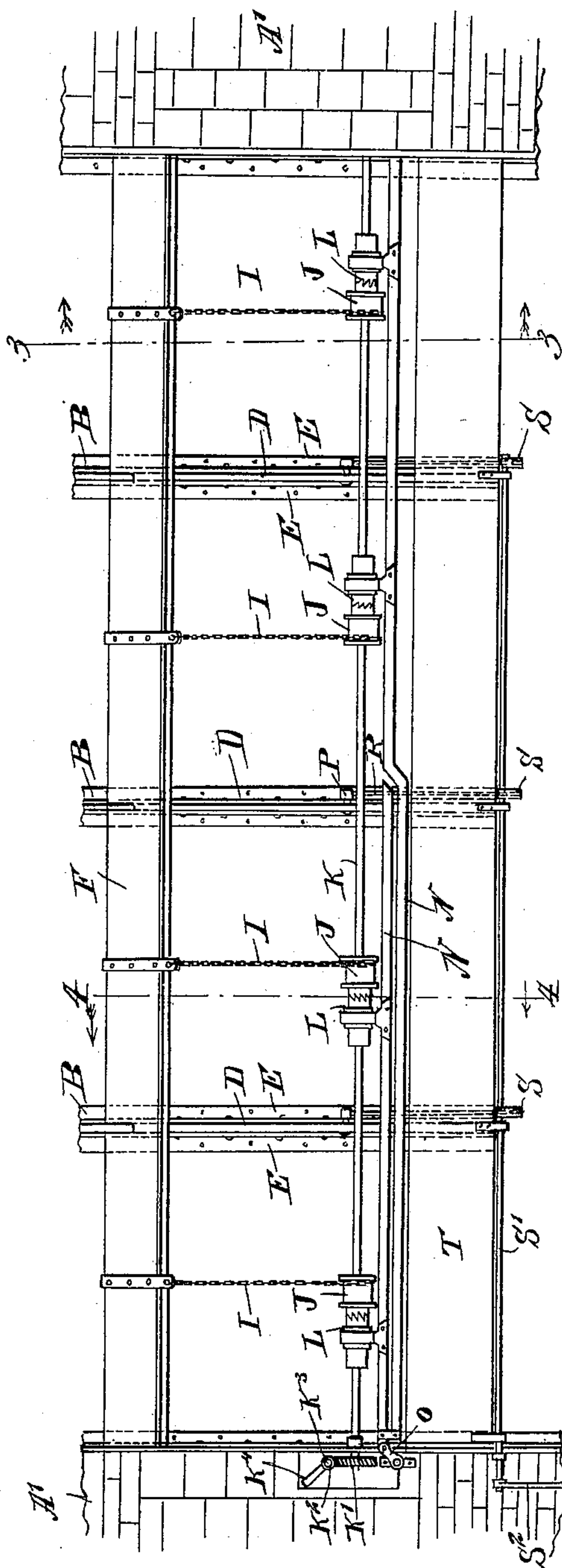


Fig 2.



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Fig. 3.

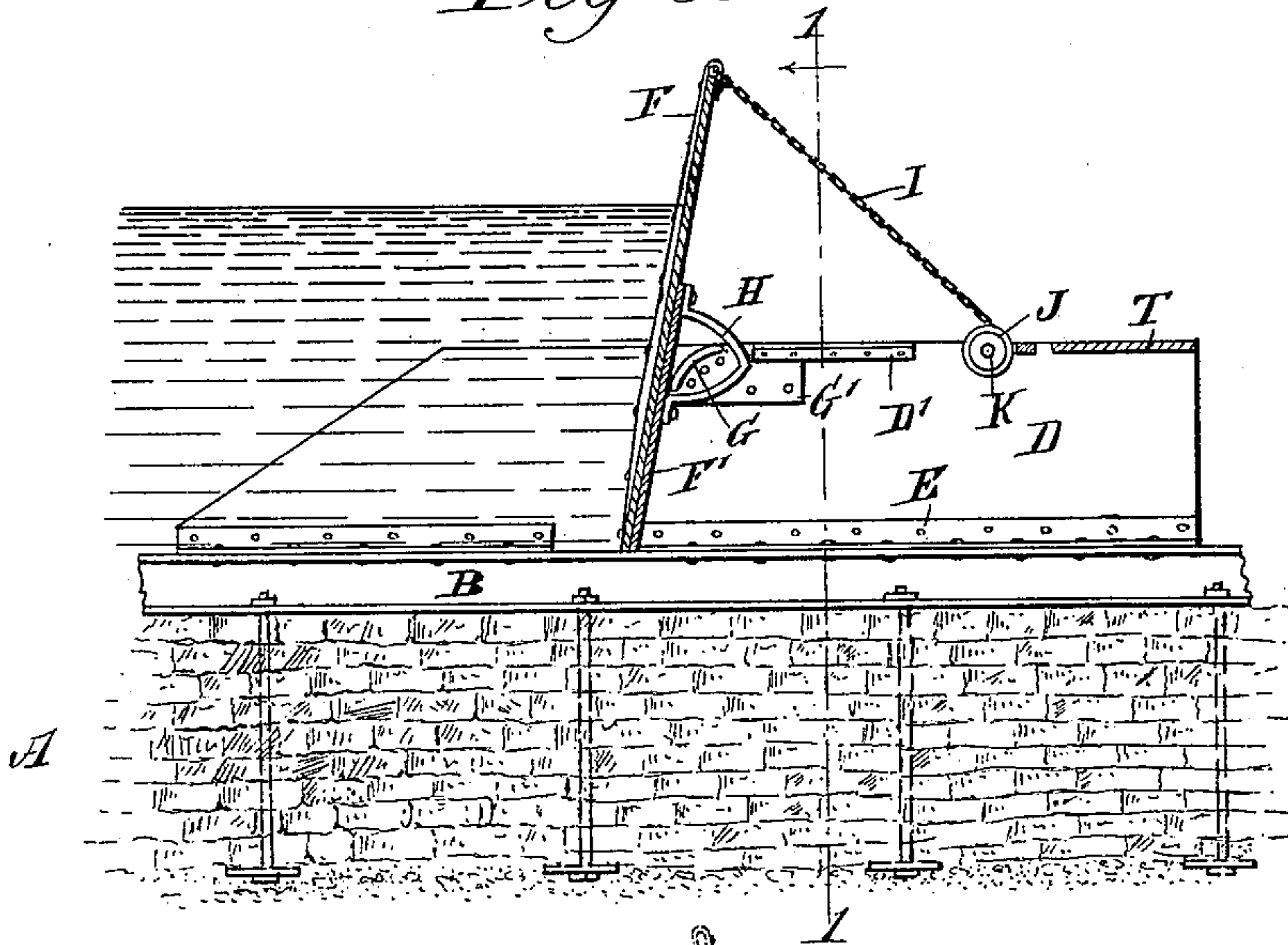


Fig. 4.

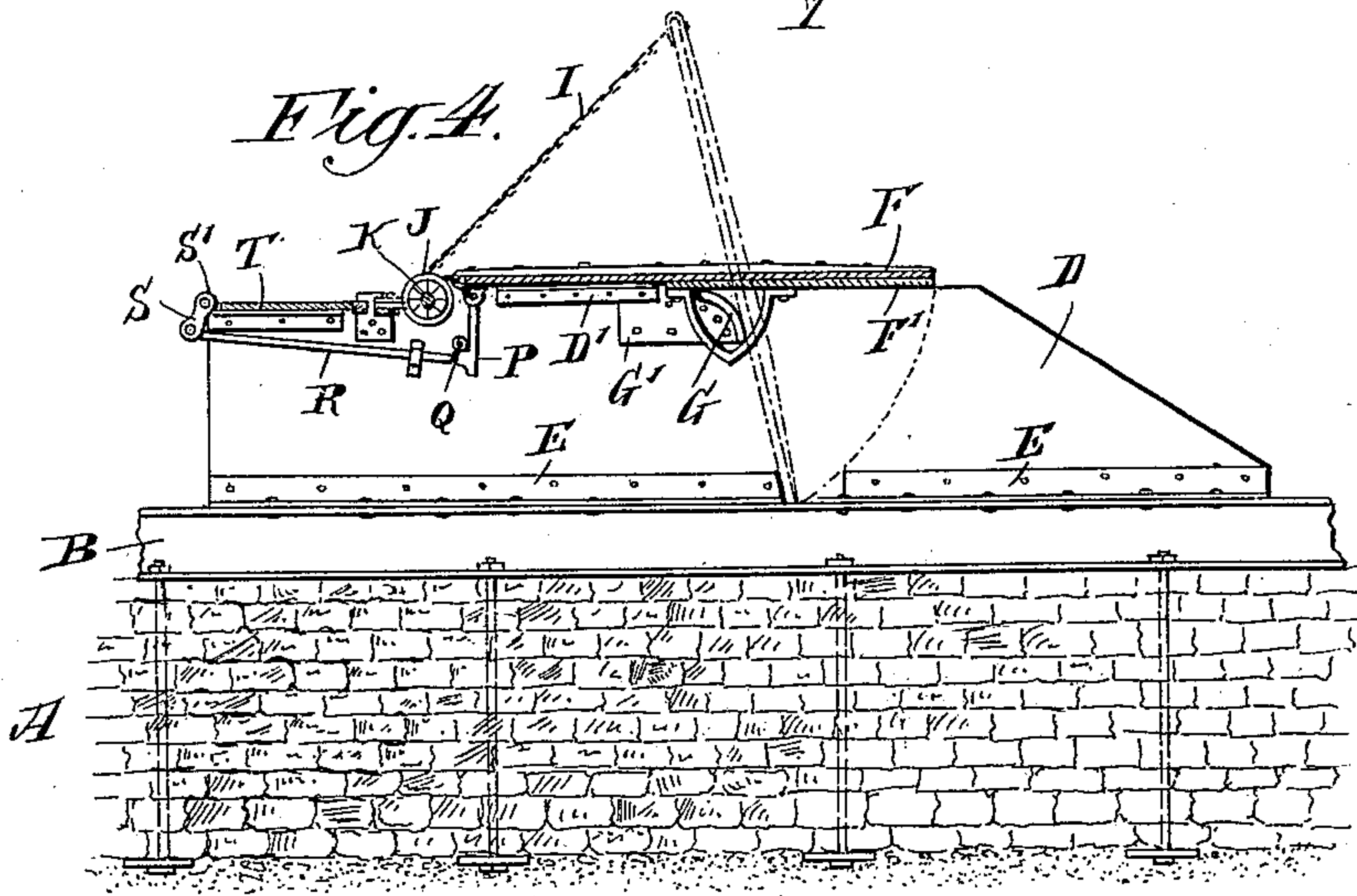
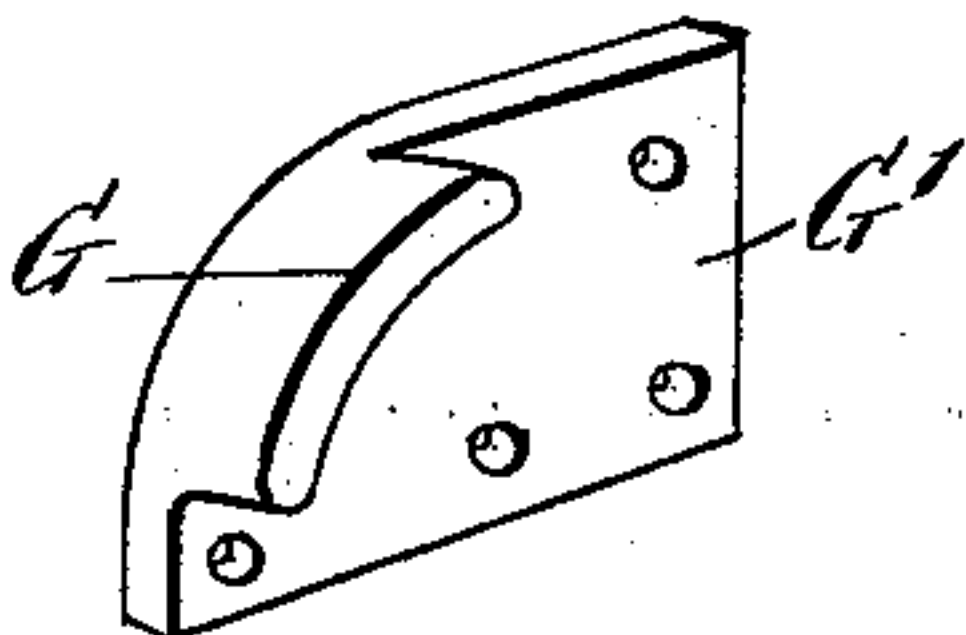


Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORG LUDWIG FUCHS, OF MEININGEN, GERMANY, ASSIGNOR OF ONE-HALF
TO ERNESTO FUCHS, OF SAME PLACE.

AUTOMATIC WEIR.

SPECIFICATION forming part of Letters Patent No. 594,733, dated November 30, 1897.

Application filed September 29, 1896. Serial No. 607,361. (No model.) Patented in Mexico July 11, 1896, No. 898.

To all whom it may concern:

Be it known that I, GEORG LUDWIG FUCHS, of Meiningen, Germany, have invented a new and improved Automatic Weir, (patented in Mexico July 11, 1896, No. 898,) of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and Improved weir arranged to open and close automatically, according to the amount of water passing down the waterway, so as to always retain the desired amount of water and permit a ready discharge of the surplus water.

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

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a transverse section of the improvement on the line 1 1 of Fig. 3. Fig. 2 is a plan view of the same. Fig. 3 is a transverse section of the same on the line 3 3 of Fig. 2. Fig. 4 is a similar view of the same on the line 4 4 of Fig. 2 and with the gate in a horizontal position, and Fig. 5 is an enlarged perspective view of the pivot.

The improved weir is provided with a suitable foundation A, on the sides of which are erected the abutments A', and on the top of the foundation are fastened longitudinally-extending I-beams B, and the space between the adjacent I-beams is filled in with suitable cement or concrete to form a smooth bottom for the weir on the top of the foundation A, as plainly indicated in Fig. 1.

On each of the I-beams B is set a vertically-extending rib D, fastened in place on the I-beam by angle-irons E, as indicated in Figs. 1, 2, and 3. A gate F extends from one abutment A' to the other and normally rests with its lower edge on the bottom of the weir, the said gate being slightly inclined upwardly and rearwardly—that is, down the waterway, as indicated in Fig. 3. The gate F may be composed of one, two, or more gates arranged independently of each other and one alongside the other. The gate F is formed in its lower portion with slots for straddling the

several ribs D, as indicated in Fig. 2, and the said gate is mounted to swing at its rear or back side on a series of rider-plates G, curved upwardly and rearwardly, as plainly indicated in Figs. 3 and 4, and forming fulcrums or supports on which the gate turns. The curved rider-plates or fulcrums G are formed or secured on plates G', bolted or otherwise fastened to opposite sides of each rib D, and the upper end of each curved rider-plate G is arranged in line with the horizontally-extending angle-irons D', secured to the longitudinal ribs D, to form a rest for the gate F when the latter moves from its upright position to a horizontal one, as is illustrated in Fig. 4.

On the back of the gate F are secured keepers H, adapted to inclose the rider-plates G, so as to prevent accidental displacement of the gate F on the rider-plates G. Now if the height of the water to be retained is equal to the height of the gate F then the rider-plates G are so located that the gate when in the upright position rests against the lower part of the rider-plates or fulcrums G at a point about one-third of the height of the gate from the bottom edge to equalize the pressure of the water on the gate above and below the resting-point.

Now if the water flowing down the waterway increases beyond the normal amount desired to be retained by the gate in the weir then the pressure on the upper portion of the gate F overbalances that of the lower part, and consequently the gate turns on the rider-plates or fulcrums G, with the upper portion swinging downward and rearward and the lower portion swinging upward and forward. When the gate is moved to the horizontal position, it rests on the rider-plates or fulcrums at a point about one-half the height of the gate. Now as the rider-plates G are curved upwardly and rearwardly it is evident that the gate opens proportionately to let one-half of the surplus water over the top edge of the gate and one-half under the bottom edge. It is understood that the gate can be arranged so as not to discharge over the top edge, but only at the bottom, the location of the rider-plates then being correspondingly arranged.

In order to strengthen the gate F, I prefer to attach to the back thereof a reinforcing-

plate F', adapted to ride on the rider-plates G and carrying the keepers H. (See Figs. 3 and 4.) It is evident that when the water increases beyond the amount to be retained and the gate swings open then its fulcrum-point, or the point at which it rests on the fulcrums or rider-plates G, changes, according to the degree the gate is turned, the resting-point of the gate on the rider-plates or fulcrums moving upwardly and rearwardly, according to the pressure of the surplus water on the gate. Thus when the surplus water has been discharged, as above explained, and a normal pressure again prevails then the gate F returns to its former position, (shown in Fig. 3,) with the lower end of the gate resting against the forward ends of the angle-irons E.

In order to permit of opening the gate F whenever desired, I connect the upper end thereof with a number of chains I, extending downwardly and rearwardly to wind on drums J, mounted to rotate loosely on a transverse shaft K, journaled in suitable bearings in the abutments A' and carrying at one end a worm-wheel K', in mesh with a worm K², secured on a vertically-disposed shaft K³, having a handle K⁴ for turning the said shaft to rotate the shaft K. Now the several drums J are adapted to be locked to the shaft K by means of clutches L, secured on the said shaft K and mounted to slide thereon to move the clutches in and out of engagement with the clutch-teeth on the drums J. Each of the clutches L is attached to one of two rods N, fitted to slide transversely and connected with a link O under the control of the operator on one of the abutments, so as to simultaneously shift the said rods and move the clutches in and out of engagement with the drums J.

When the gate F moves into a horizontal position either by the pressure of the water or by the operator manipulating and winding up the chains I and the drums J, as described, then the hooks P, held on the upper end of the gate F, drop upon transversely-extending pins Q, secured in the ribs D, as shown in Fig. 4. The hooks P are adapted to be thrown out of engagement with the pins Q by means of rods R, fitted to slide longitudinally on the ribs D and pivotally connected at their outer ends with arms S, secured on a shaft S', journaled in brackets attached to a runway or gang-plank T, extending from one abutment to the other in the rear of the gate F. One end of the shaft S' carries a lever S², under the control of the operator, to simultaneously manipulate the several rods R, so as to throw the several hooks P out of engagement with the pins Q whenever it is desired to unlock the gate F and return the same from its forward position back to an upright position.

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

1. An automatic weir provided with a transversely-extending gate, curved rider-plates

against which the said gate leans, longitudinal ribs to which the said rider-plates are firmly attached, the said ribs serving to guide the gate in its tipping motion on the said rider-plates, and curved keeper-irons attached to the gate to guide the latter over the curved rider-plates, while the gate is changing its supporting-point from about one-third of the height of the gate to one-half the height thereof in opening, and also to guide the gate on the return movement, substantially as set forth.

2. An automatic weir provided with a transversely-extending gate, curved rider-plates on which the said gate is adapted to move, longitudinal ribs to which the said rider-plates are firmly attached, the said ribs serving as supports as well as guides to the gates, and keeper-irons attached to the gate to guide the same in its tipping movement over the curved rider-plates while changing from the closing position to the open position, as set forth.

3. An automatic weir provided with a gate, a curved fulcrum engaged by the back of said gate, a support to which the said fulcrum is rigidly secured, the said support forming a rest for the gate when the latter moves over the said fulcrum into the horizontal position, and keeper-irons rigidly secured to the gate and extending rearwardly therefrom, the said keeper-irons inclosing the said fulcrum to prevent accidental displacement of the gate while changing its position on the fulcrum, substantially as set forth.

4. An automatic weir, provided with a transversely-extending gate, curved supports fastened to fixed parts of the weir and engaged by the back of the said gate to form a fulcrum for the latter, a rest for the said gate when the latter is moved to an open position, and means for fastening the gate in the open position, substantially as set forth.

5. An automatic weir, comprising a series of longitudinal ribs secured in the waterway of the weir, upwardly and rearwardly curved fulcrums secured to the said ribs and in transverse alinement with one another, and a gate straddling said ribs and resting with its back on the said fulcrums, substantially as shown and described.

6. An automatic weir, comprising a series of longitudinal ribs secured in the waterway of the weir, upwardly and rearwardly curved fulcrums secured to the said ribs and in transverse alinement with one another, a gate straddling said ribs and resting with its back on the said fulcrums, and angle-irons secured to the said ribs and forming a rest for the said gate when the latter moves over the said fulcrums into a horizontal position, substantially as shown and described.

7. An automatic weir, comprising a series of longitudinal ribs secured in the waterway of the weir, upwardly and rearwardly curved fulcrums secured to the said ribs and in transverse alinement with one another, a gate straddling said ribs and resting with its back

on the said fulcrums, and means, substantially as described for positively locking said gate in an open position by swinging the latter on said fulcrums, as set forth.

5 8. An automatic weir, comprising a series of longitudinal ribs secured in the waterway of the weir, upwardly and rearwardly curved fulcrums secured to the said ribs and in transverse alinement with one another, a gate
10 straddling said ribs and resting with its back on the said fulcrums, angle-irons secured to the said ribs and forming a rest for the said gate when the latter moves over the said fulcrums in a horizontal position, and a locking
15 device for locking the said gate in a horizontal position, as set forth.

9. An automatic weir, comprising a series

of longitudinal ribs secured in the waterway of the weir, upwardly and rearwardly curved fulcrums secured to the said ribs and in 20 transverse alinement with one another, a gate straddling said ribs and resting with its back on said fulcrums, angle-irons secured to the said ribs and forming a rest for the said gate when the latter moves over the said fulcrums 25 in a horizontal position, a locking device for locking the said gate in a horizontal position, and means, substantially as described, for unlocking said gate when in a horizontal position, as set forth.

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