

(No Model.)

M. D. CZVETKOVICS.  
WEIR.

3 Sheets—Sheet 1.

No. 441,470.

Patented Nov. 25, 1890.

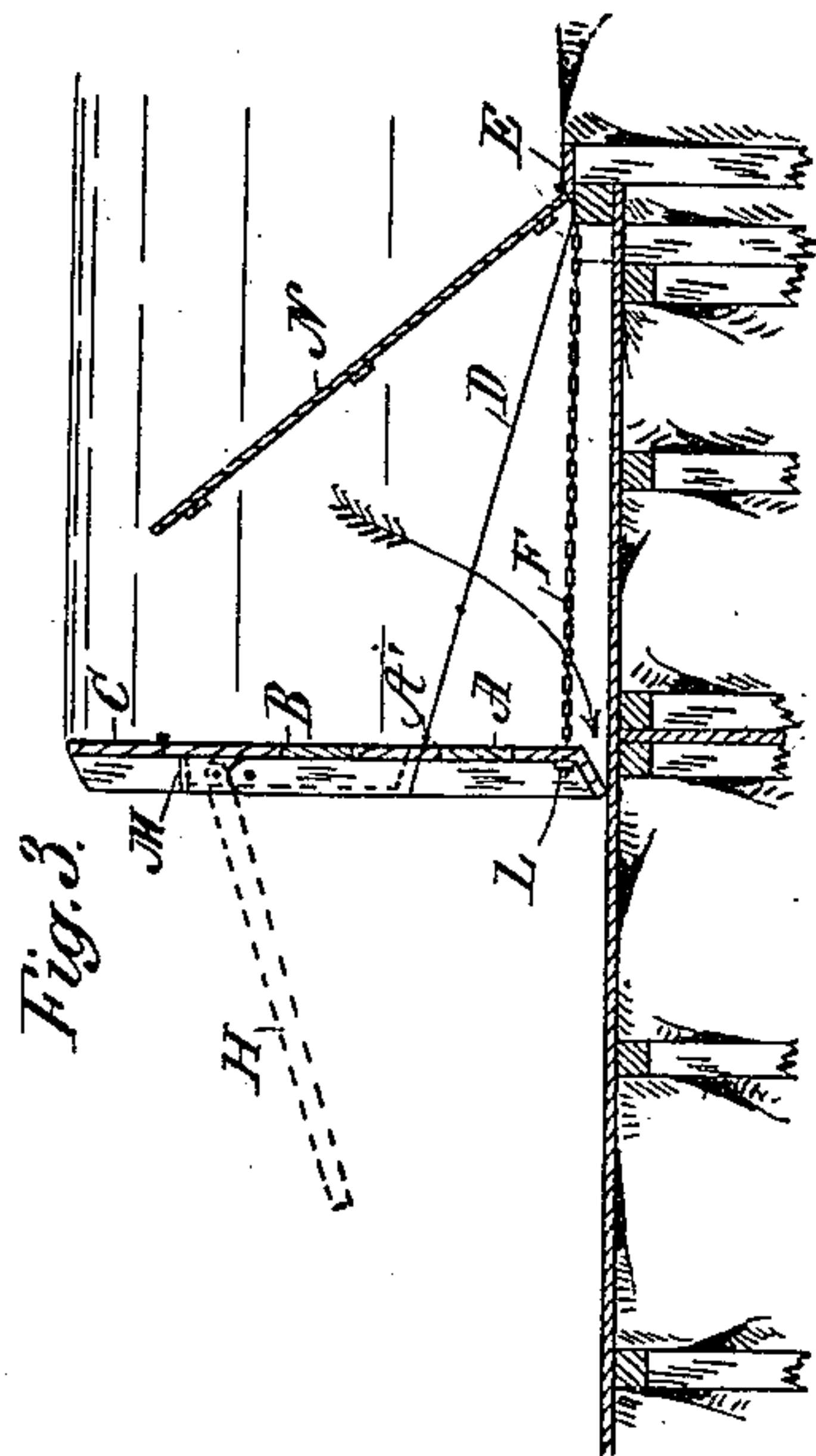


Fig. 3.

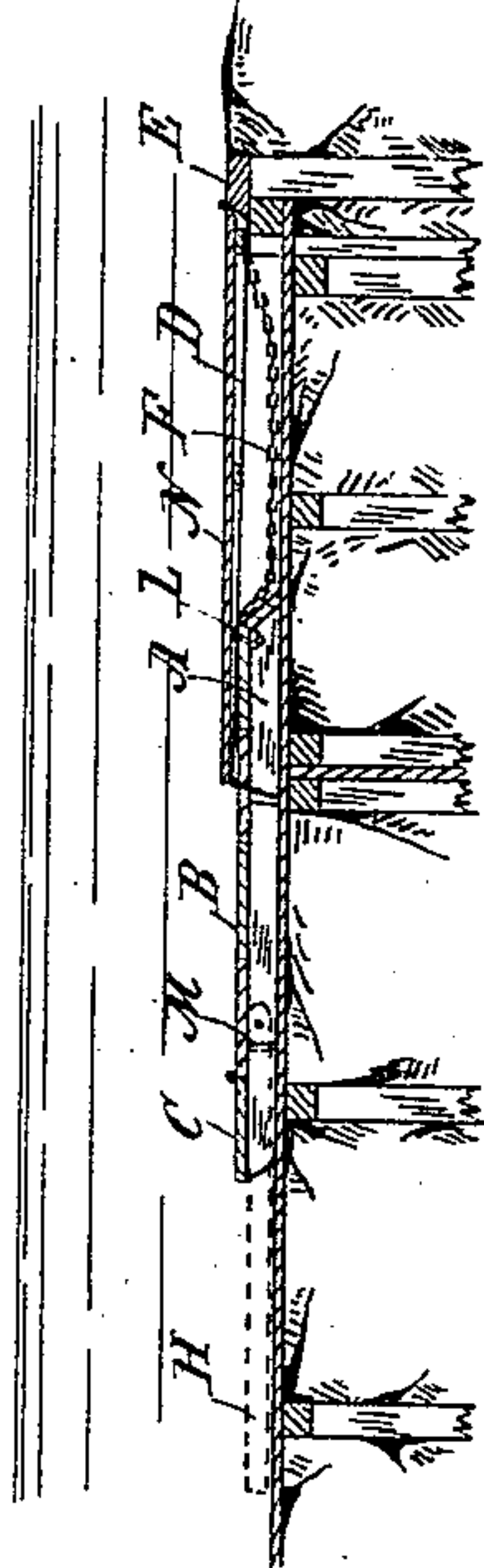


Fig. 4.

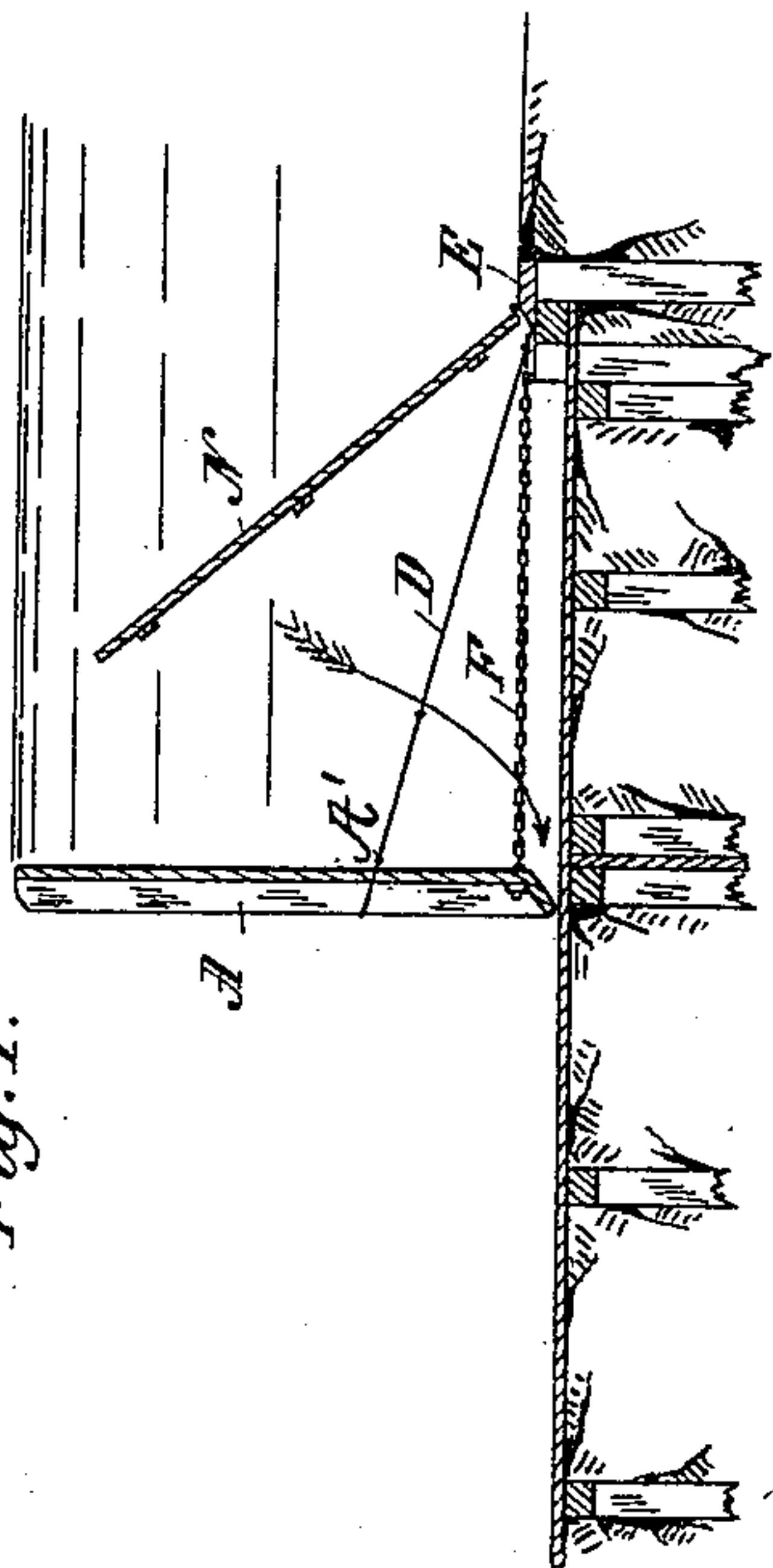


Fig. 1.

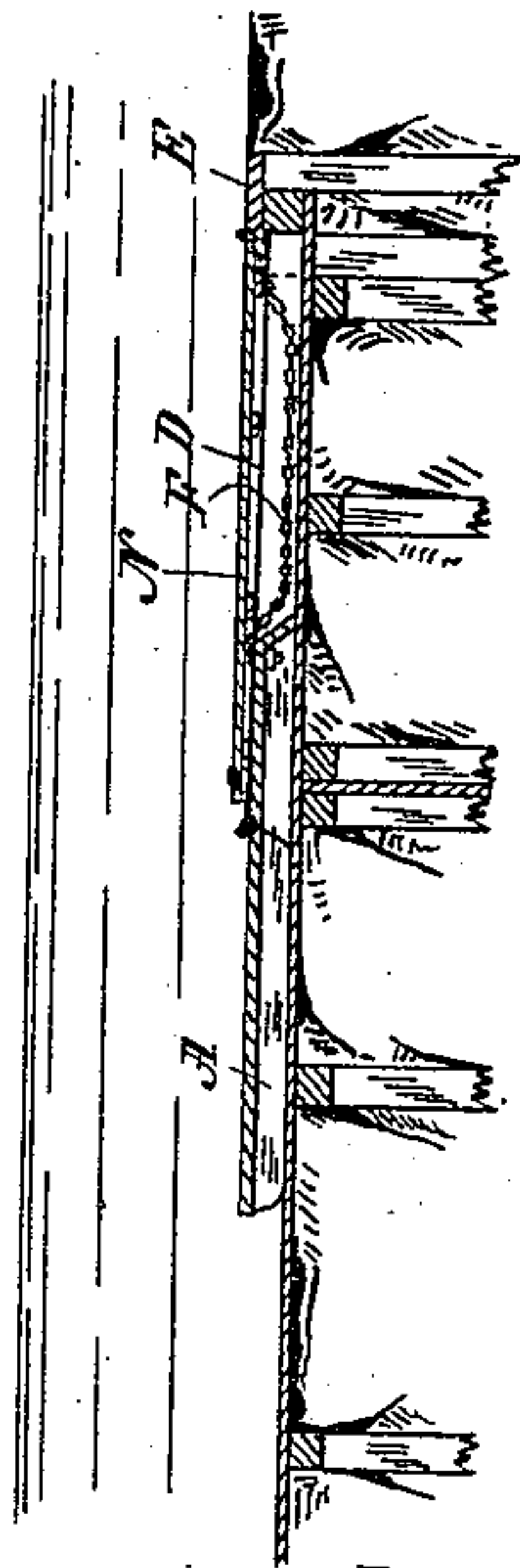


Fig. 2.

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Fig. 7.

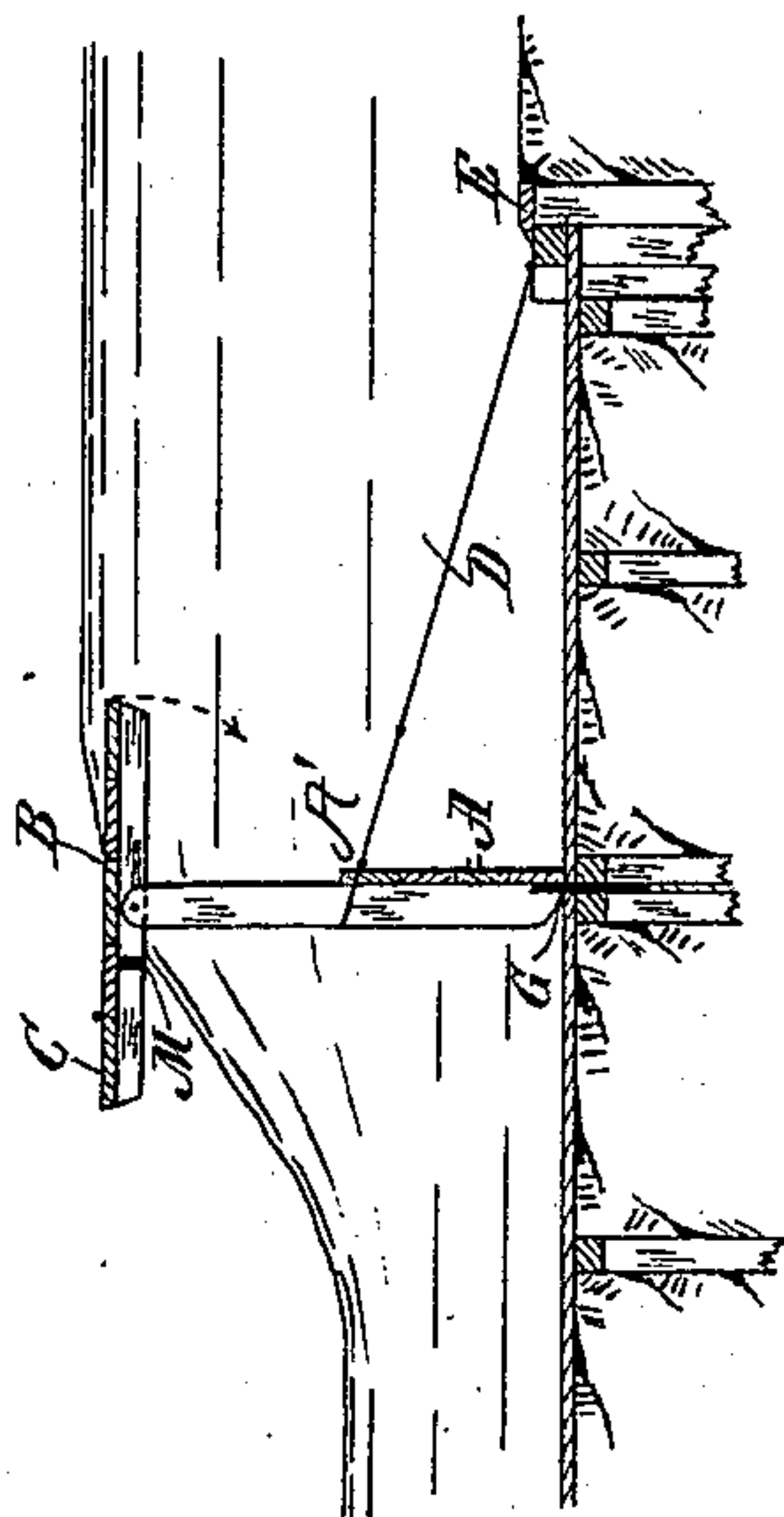


Fig. 8.

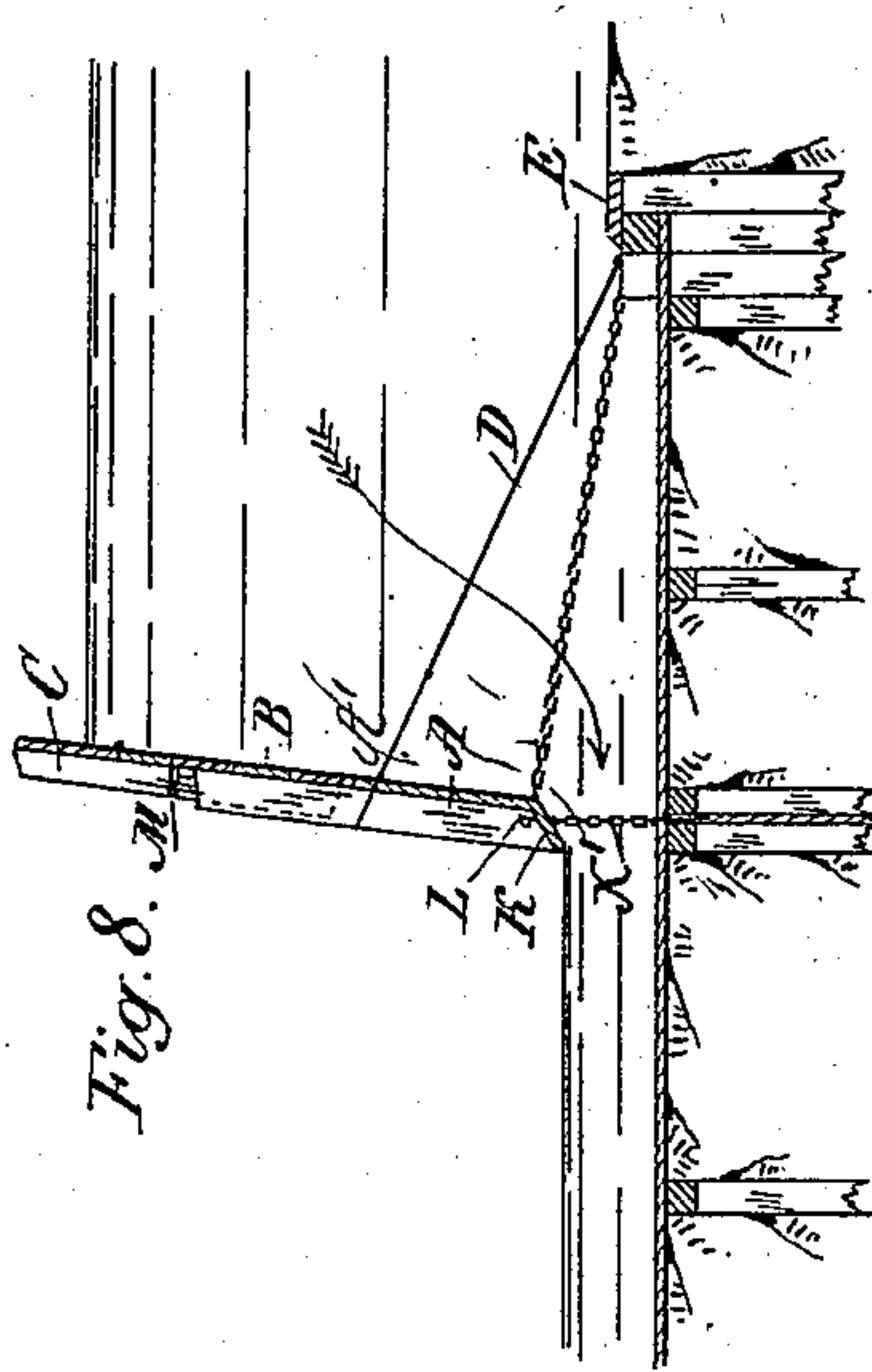


Fig. 5.

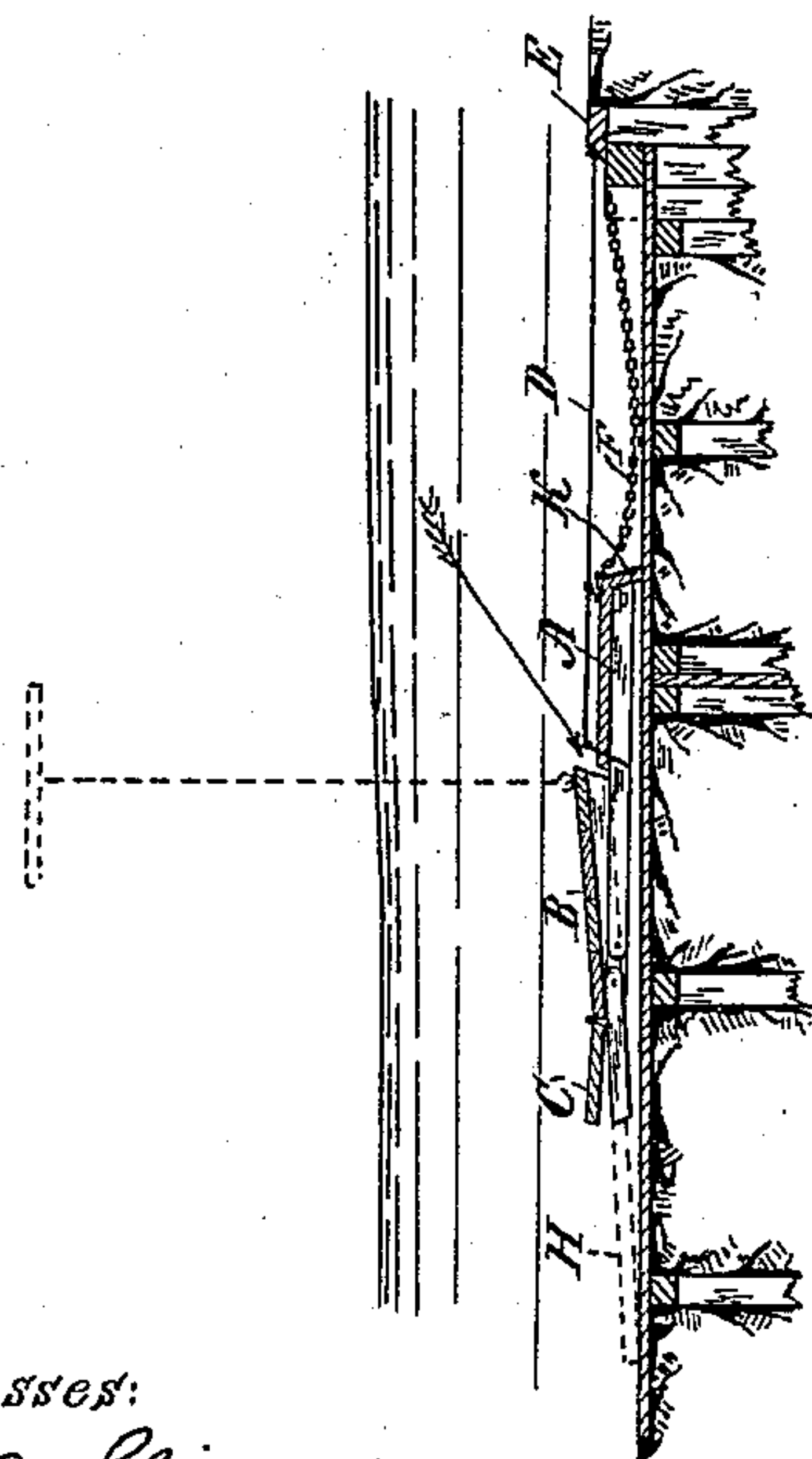
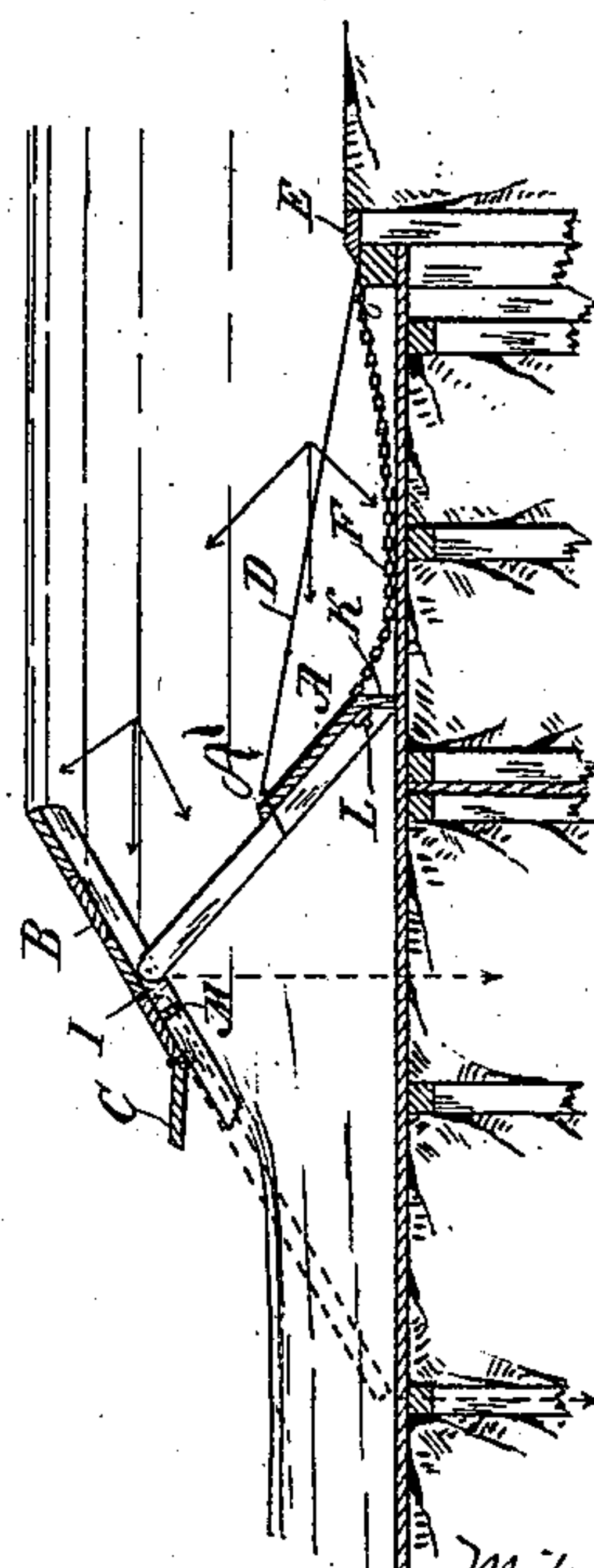


Fig. 6.



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Fig. 9.

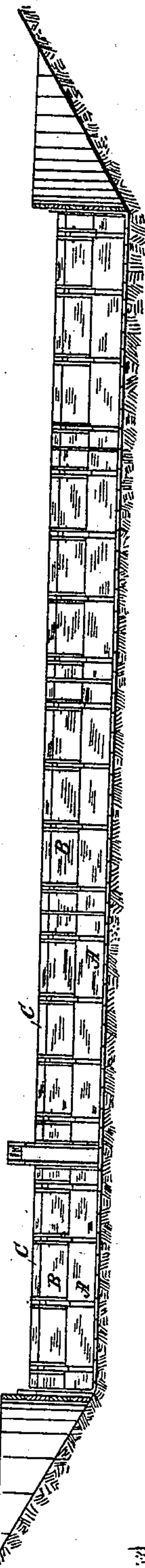
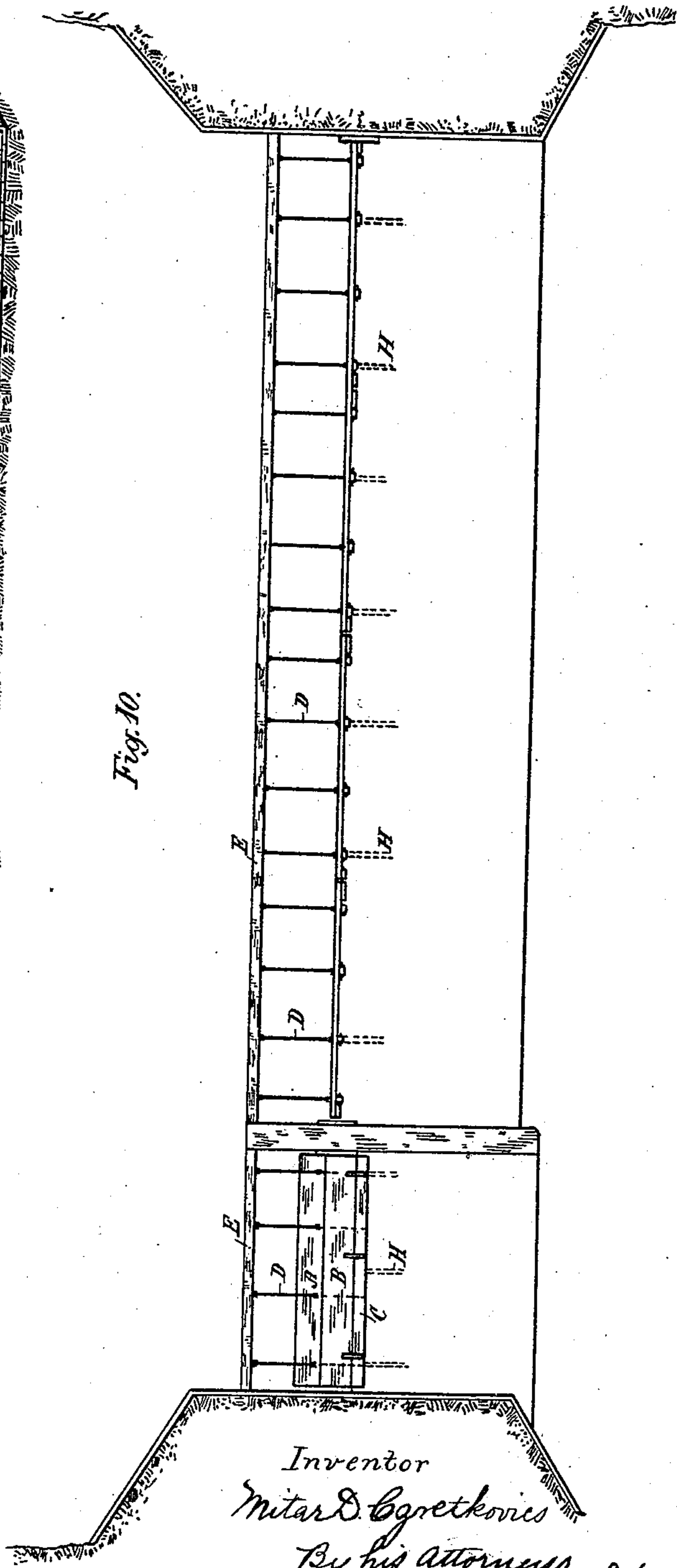


Fig. 10.



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# UNITED STATES PATENT OFFICE.

MITAR DEMETER CZVETKOVICS, OF VIENNA, AUSTRIA-HUNGARY.

## WEIR.

SPECIFICATION forming part of Letters Patent No. 441,470, dated November 25, 1890.

Application filed April 14, 1890. Serial No. 347,837. (No model.)

*To all whom it may concern:*

Be it known that I, MITAR DEMETER CZVETKOVICS, a subject of the Emperor of Austria-Hungary, and a resident of the city of Vienna, in Austria-Hungary, have invented certain new and useful Improvements in Weirs, of which the following is a specification.

This invention relates to a weir which is adapted to be automatically turned down at high water.

Figure 1 is a sectional view of a weir according to this invention, showing the weir in its upright position. Fig. 2 is a similar view showing the weir turned down. Figs. 3 and 4 are views similar to Figs. 1 and 2, respectively, showing a modified construction of weir. Figs. 5, 6, 7, and 8 are sectional elevations showing the different positions the weir takes. Figs. 9 and 10 are respectively a front elevation and a plan view of a sectional dam constructed of my weirs.

The body A of this weir is composed of longitudinal beams and transverse ribs, and is connected by means of a rod D with a sill E, let into the bed of a stream. Its lower edge bears either against a sill G in the bed of the stream or is held by a chain attached to the sill E. The height of the point A' where the said rod D and the body A of the weir are connected is below the center or balancing-point of the weir, such that under normal conditions the point of application of the resultant of the water-pressure exerted upon the weir will be below the aforesaid point A' and the water-pressure will hold the weir upright; but as soon as, in consequence of high water, the point of application of the resultant of the pressure exerted upon the weir passes above the said point A' the weir will turn down to the position shown in Fig. 2, in which it will permit the high water to flow off unobstructed. As difficulties are experienced in putting the weir thus turned down in an upright position again, it is expedient to construct the weir as represented in Figs. 3 to 7. In this case the body of the weir comprises a lower part A, the upper edge of which is connected by rods D with a sill E, let into the bed of the stream, and an upper part, which is pivoted to the upwardly-prolonged vertical ribs of the aforesaid lower part, and consists of two portions B and C, that are pivoted together. The

parts A, B, and C are rendered water-tight in any suitable manner.

As the two portions B and C of the upper part and also the lower part of the weir can only turn in the opposite direction to that of the pressure of the column of water, the latter will under normal conditions hold the weir upright; but as soon as the level of the water has risen to such an extent that the point of application of the pressure exerted upon the surface of the weir passes above the upper edge of the lower part A—that is to say, above the point A' where the weir is connected with the above-mentioned rod D—the entire weir will be turned down by the pressure of the water, as in the arrangement shown in Figs. 1 and 2, and will no longer offer any obstruction to the water, Fig. 4. In order to raise the turned-down weir again in this case, it is merely necessary to lift by hand the lower portion of the upper part of the weir through the medium of a hook or the like, Fig. 5. The pressure of the running water seizes the upper part of the weir at the lower side, thereby lifting the whole weir to the position shown in Fig. 6. The hinging of the part C facilitates the raising of the weir by allowing a larger opening through which the water passes.

To the upper part B of the weir is pivoted a rod H, the free end of which bears upon the bed of the stream, while its upper end supports the upper portion of B, as indicated in Fig. 6, thus preventing the turning of the upper part of the weir in the wrong direction. In the lifting of the weir the lower part A of the same passes to such a position that its lower edge will be displaced by the pressure of the water until it strikes against the above-mentioned sill, or until the chain F is stretched and the lower part A is vertical. The aforesaid rod H will in this case bear against the lower part of the weir, and the upper part of the latter, passing through the horizontal position, Fig. 7, will take up the position represented in Fig. 3. In this arrangement the weir will be automatically turned down if the water rises above the height, which is deemed admissible, and will be raised automatically or with very little aid if the normal conditions of the water are restored; but the height of the column of water would not be constant



in the case of a mean or low water level, but, assuming the sectional area of the space for the passage of the water to be always the same, would depend upon the level of the water in case this flap-weir did not operate as an overfall-weir. For this reason the weir, in cases where great importance is attached to the constancy of the height of the water column, is constructed so as to constitute an overfall-weir, and the point of the connection between the lower part A of the weir and the above-mentioned rod D is placed at such a height that the hydrostatic pressure can effect the turning down of the weir only when a predetermined maximum height has been reached. A stop I on the back of the upper part of the weir holds up the said rods H when the weir is raised, Fig. 3.

In cases where it may not be practicable to construct the weir as an overfall-weir a constant height of the column of water can be obtained by providing a bevel K at the lower edge of the weir and placing the weir in an oblique position, as shown in Fig. 8. The pressure of the column of water then tends to raise the weir proportionately to the level of the water, and thus increase the sectional area of the space for the passage of the excess of water which runs off below the weir, so that the height of the column of water will remain constant. To prevent the weir being raised too high, use is made of a protecting-rack N, which also retains any material which may have been carried away, or the lower edge of the lower part A is connected by a small chain *k'* with the bed of the stream. Under these circumstances the weir when the afflux of water is too great is automatically turned down, and also subsequently raised, in the manner hereinbefore described. For regulating the inclination of the flap-weir the above-mentioned chain F can be shortened or lengthened by means of an adjusting-screw L. On the outside of the upper part of the weir can be arranged a bar M or the like for enabling the person in charge to pass to any part of the weir.

For broad beds of streams two or more in-

dependent weirs constructed in the above-described manner can be placed side by side, as shown in Figs. 9 and 10.

I claim as my invention—

1. A weir having a body, a chain connecting the lower end of the said body to the bed of the stream, and a rod or rods connected at one end to the bed of the stream and at the other end pivoted to the said body at a point below the center, whereby a surplus of water will cause the body to turn over, substantially as and for the purposes set forth.

2. A weir having a body composed of three parts hinged together, substantially as described, a chain connecting the lower end of the said body to the bed of the stream, and a rod or rods connected at one end to the bed of the stream and at the other end pivoted to the said body at a point below the center, whereby a surplus of water will cause the body to turn over, substantially as and for the purposes set forth.

3. A weir having a body the lower edge of which is beveled, a chain connecting the lower end of the body to the bed of the stream, means for adjusting the length of the chain, and a rod or rods connected at one end to the bed of the stream and at the other end pivoted to the said body at a point below the center, whereby a surplus of water will cause the body to turn over, substantially as and for the purposes set forth.

4. A weir having a body, a chain connecting the lower end of the said body to the bed of the stream, a rod or rods connected at one end to the bed of the stream and at the other end to the said body at a point below the center, the said body having its lower edge beveled and being adapted to rise, and means, substantially as described, for preventing too great a rise of the body, substantially as and for the purposes set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

MITAR DEMETER CZVETKOVICS.

Witnesses:

T. G. HARDY,

E. G. J. MOELLER.