

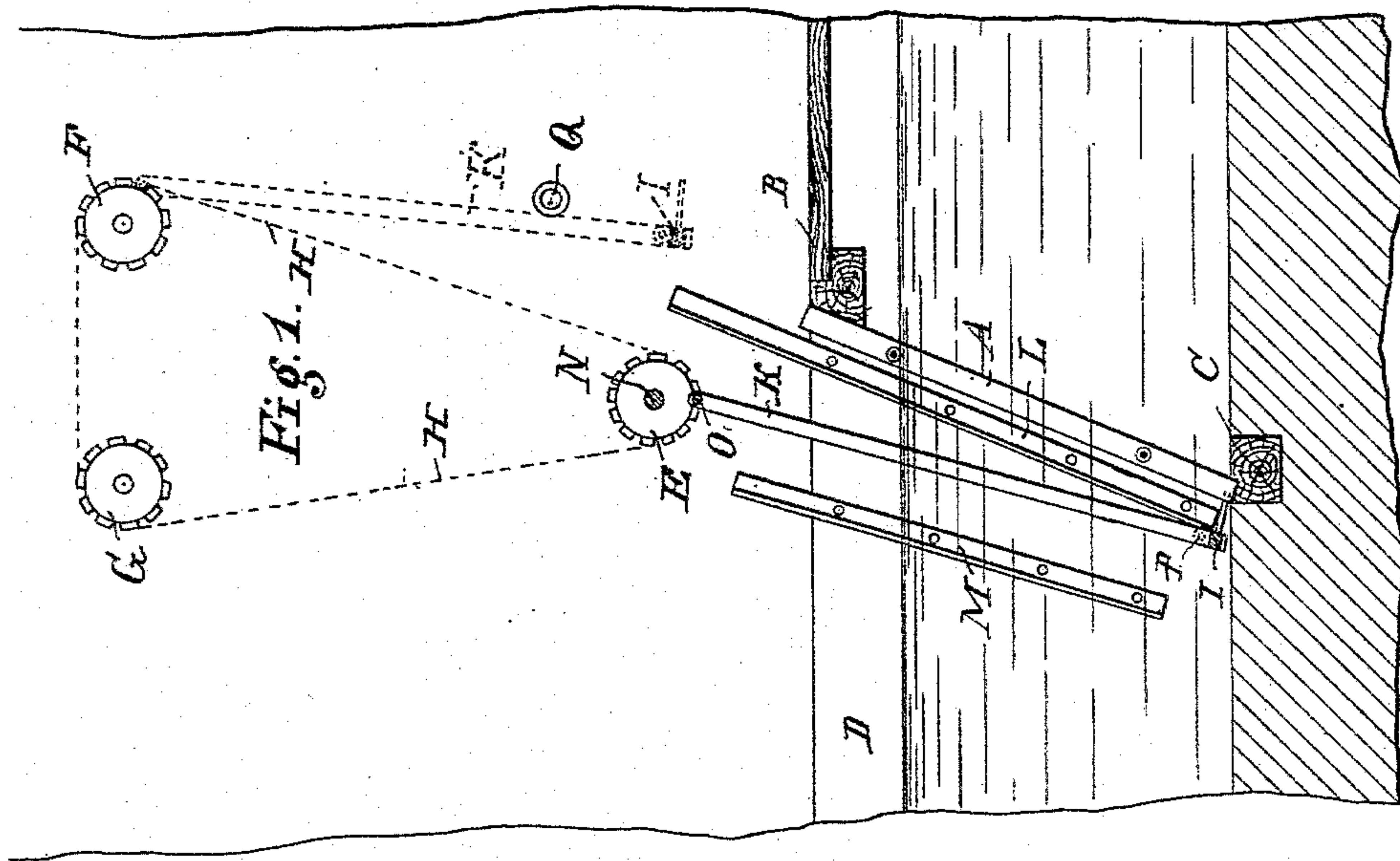
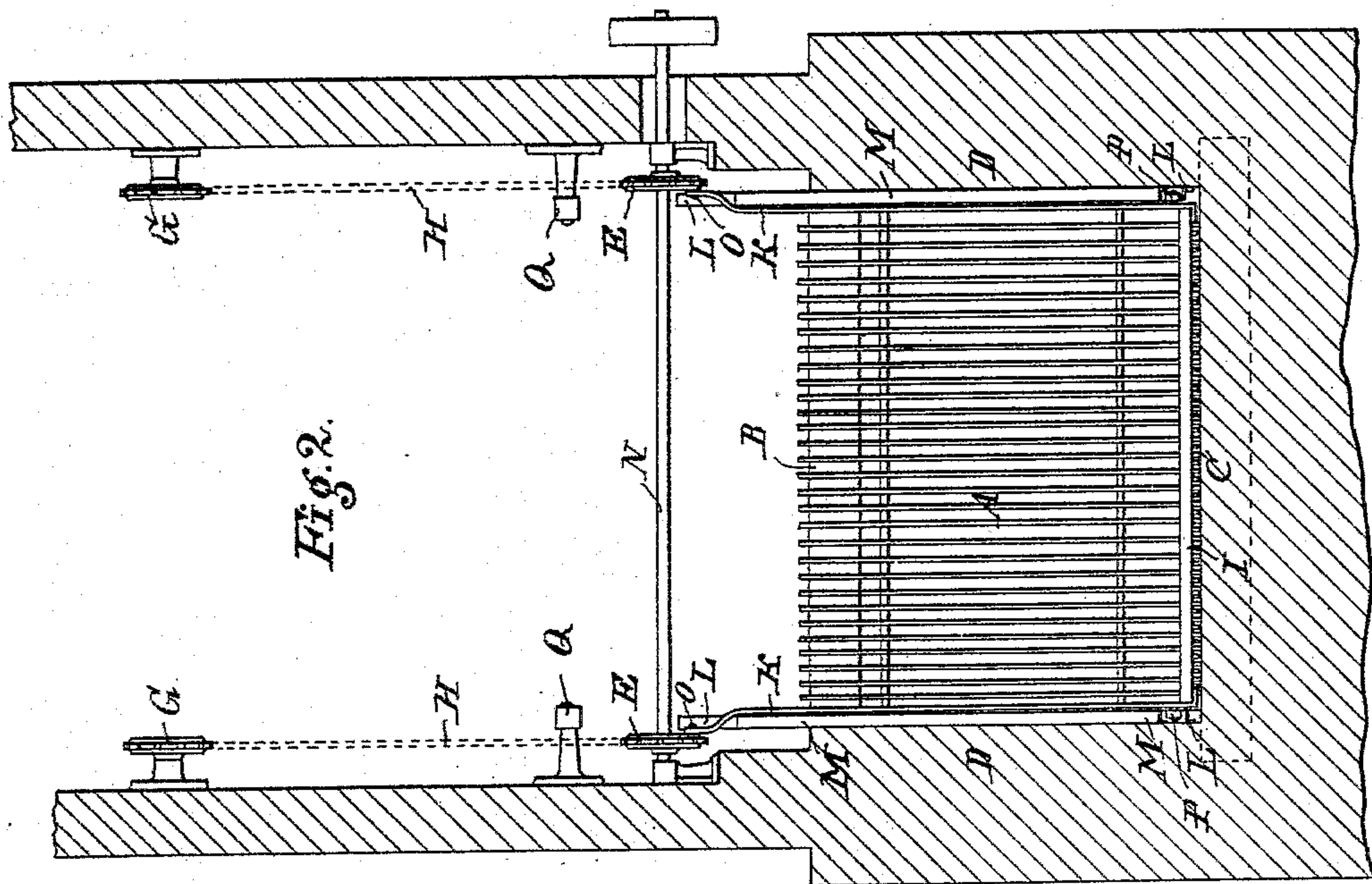
(No Model.)

5 Sheets—Sheet 1.

F. CÖRRELL.
FLUME SCREEN.

No. 495,023.

Patented Apr. 11, 1893.



Witnesses:

E. B. Bolton

E. H. Sturtevant

Inventor:

Friedrich Correll

By

Richard S. R.
his Attorneys.

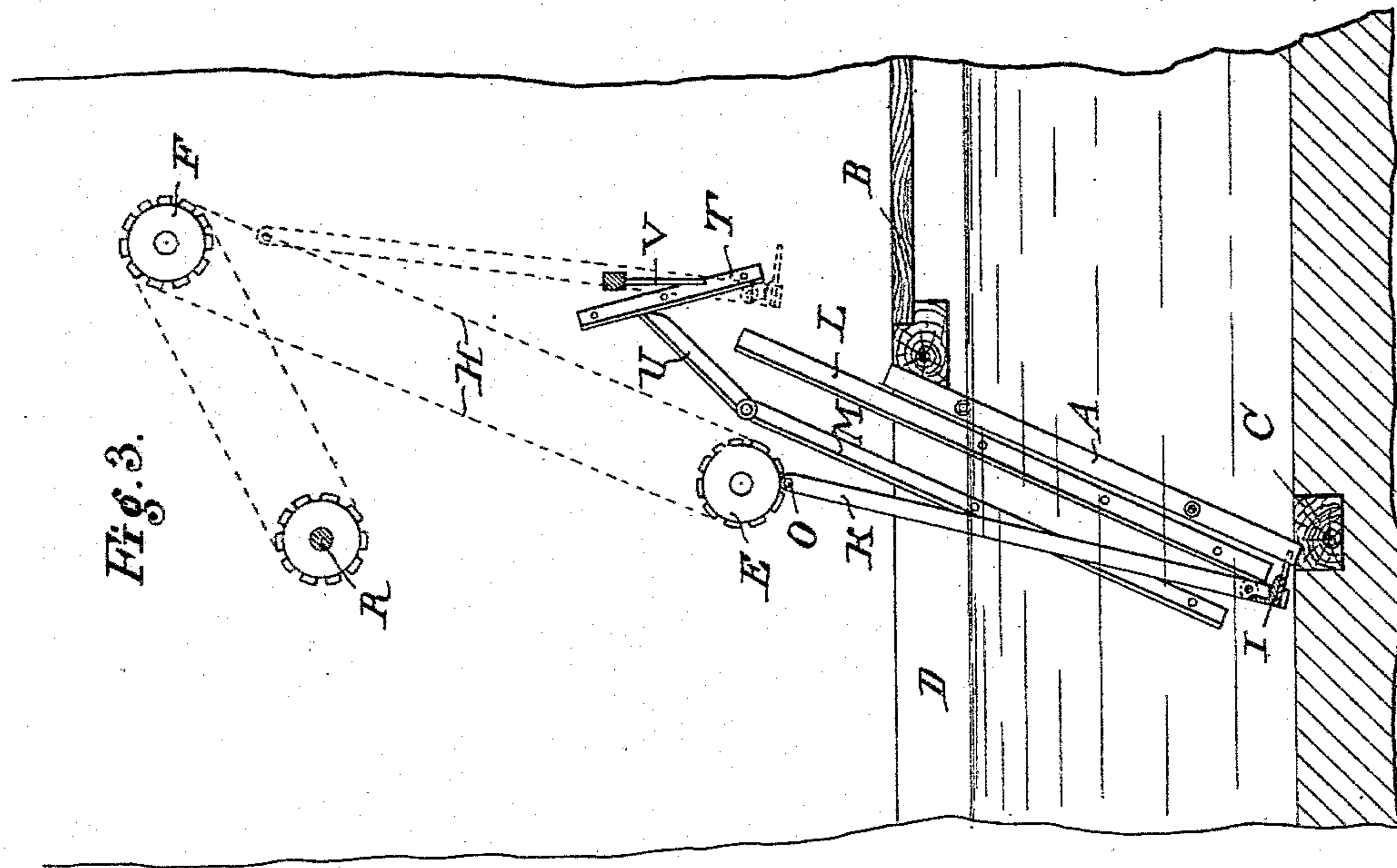
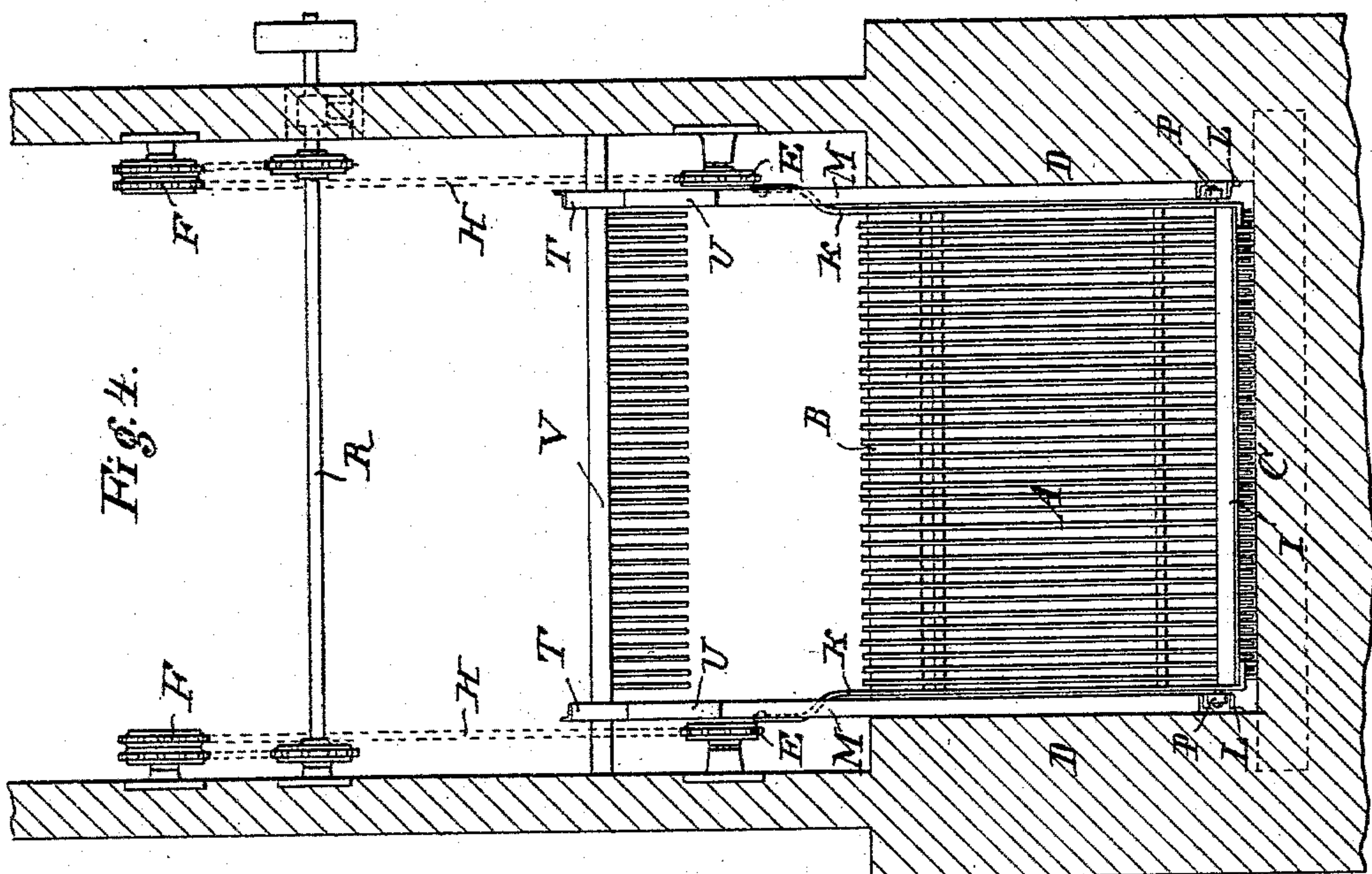
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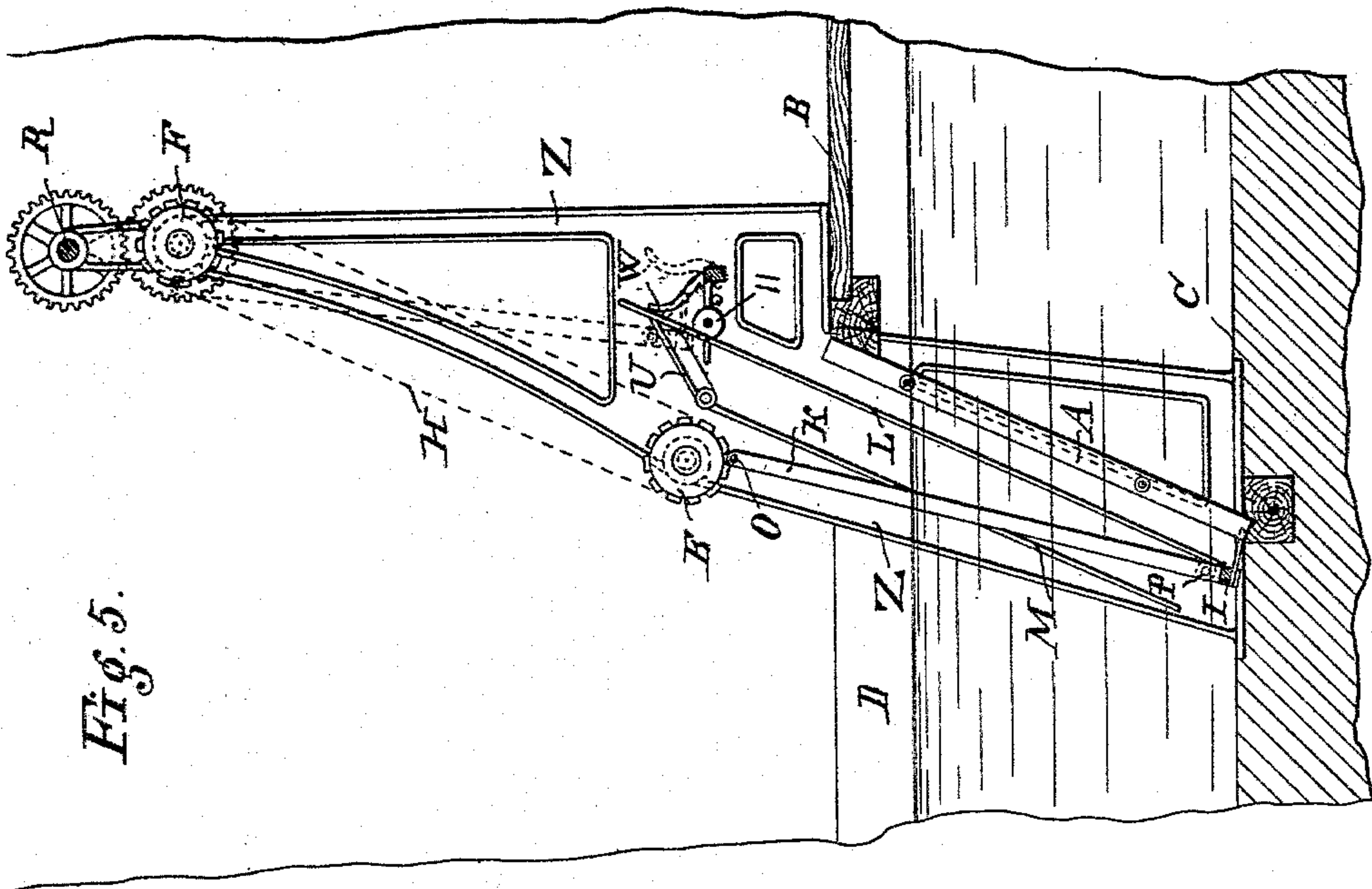
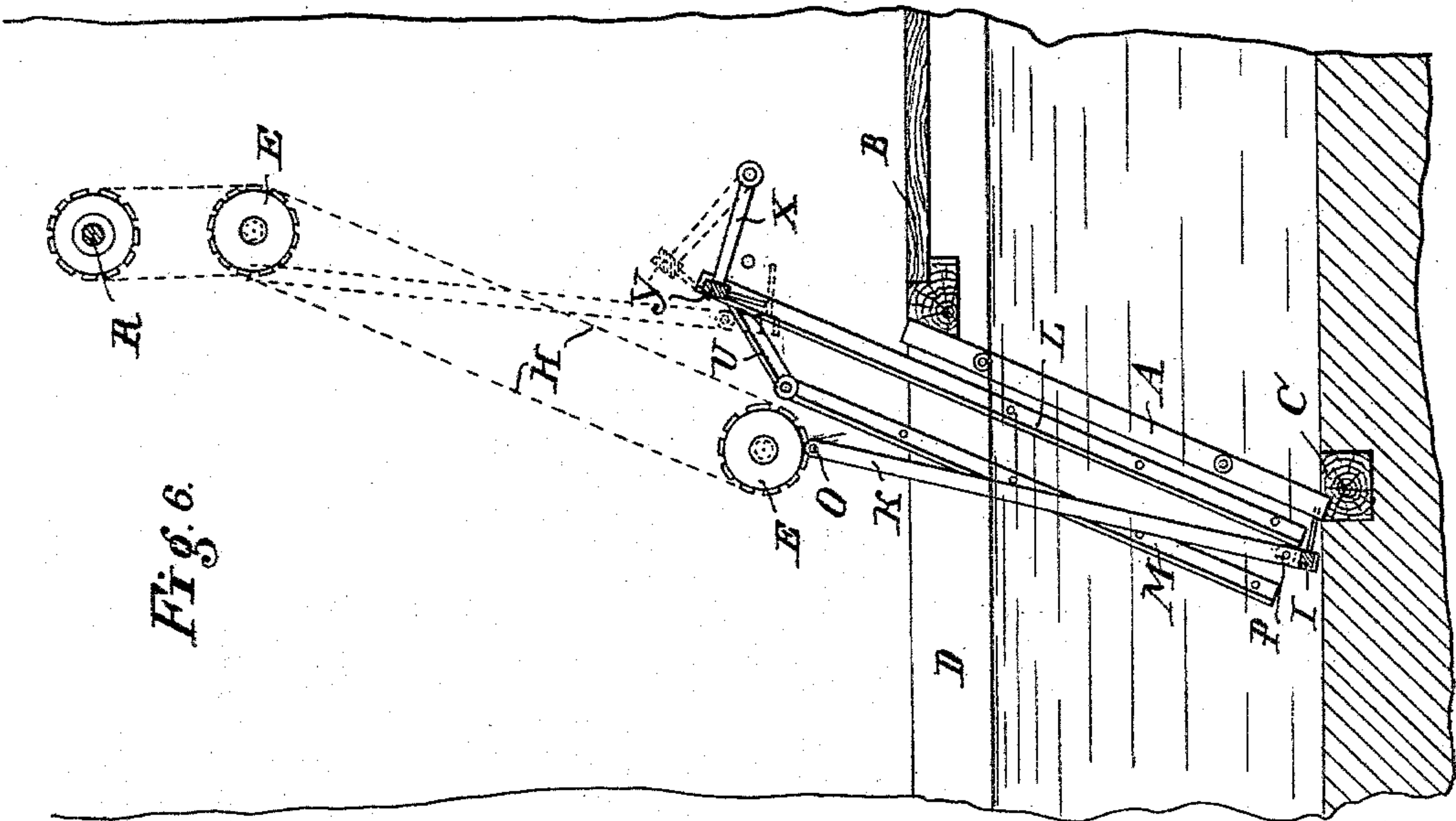
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5 Sheets—Sheet 4.

F. CÖRRELL.
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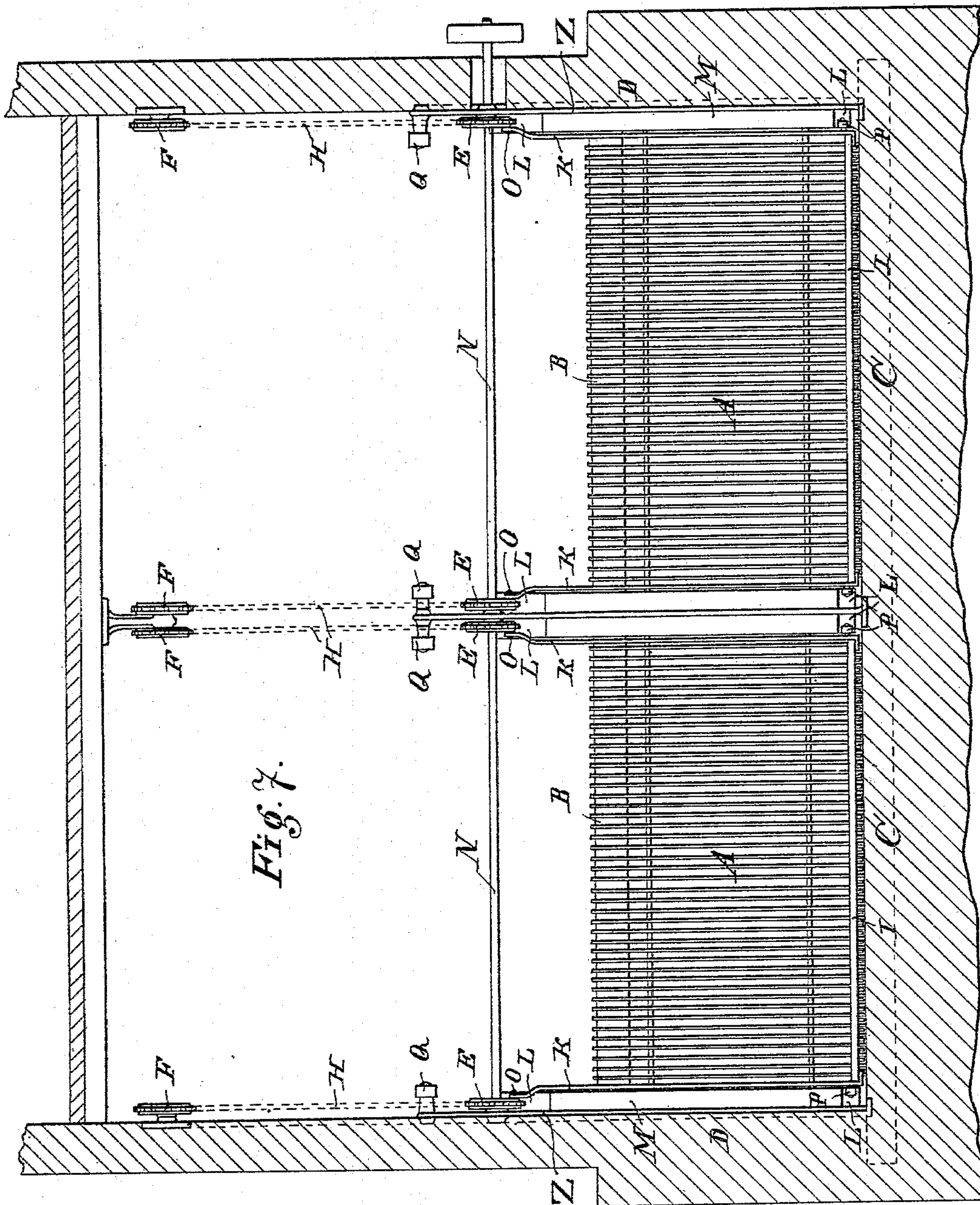


Fig. 7.

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(No Model.)

5 Sheets—Sheet 5.

F. CÖRRELL.
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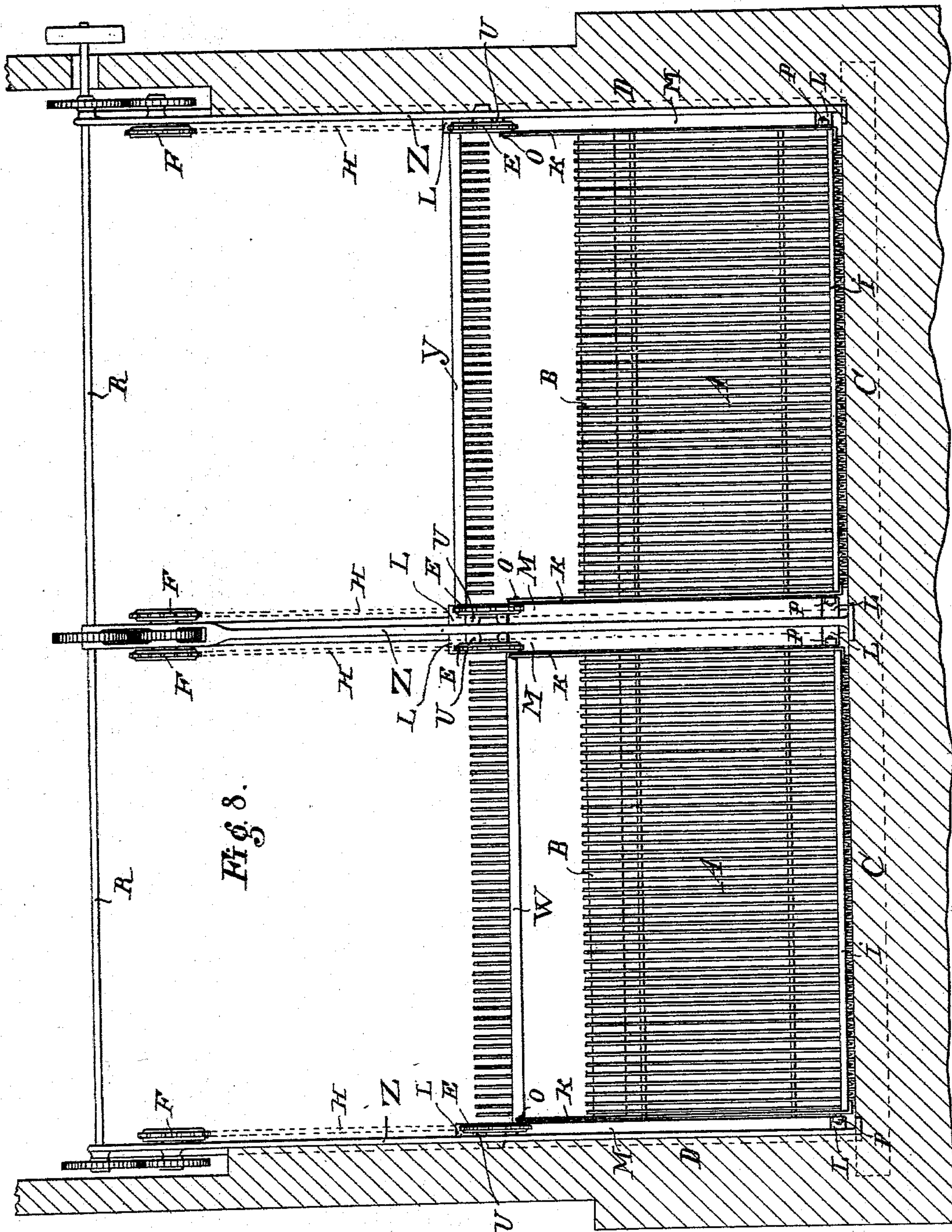


Fig. 8.

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UNITED STATES PATENT OFFICE.

FRIEDRICH CÖRRELL, OF FRANKFORT-ON-THE-MAIN, GERMANY.

FLUME-SCREEN.

SPECIFICATION forming part of Letters Patent No. 495,023, dated April 11, 1893.

Application filed November 5, 1892. Serial No. 451,058. (No model.)

To all whom it may concern:

Be it known that I, FRIEDRICH CÖRRELL, a subject of the Emperor of Germany, resident at Frankfort-on-the-Main, Germany, have invented new and useful Improvements in Means for Collecting and Removing Floating Débris, of which the following is a specification.

My invention has for its object the continuous removal from flowing water serving to supply turbines, water wheels, hydraulic engines, pumps, &c., of all solid matter floating therein or carried along thereby, such as pieces of wood, leaves, grass, rags, ice and the like, and it consists in apparatus for arresting these solid matters consisting of a straining grid or grating from which the deposits are continuously removed by clearing devices and deposited thereby upon a platform arranged behind the grating. Various contrivances have already been proposed for this purpose, which however are all liable, more or less, to various disadvantages which prevent their general adoption. Thus for example with one kind of such apparatus the movable mechanism, consisting of chains and chain wheels, are immersed in the water, and with another kind in which the chains and chain wheels are dispensed with, the moving mechanism being out of the water, there is however a spindle or toothed rack passing through the water which carries the clearing comb and in addition change wheels and reversing gear are required in these constructions for the purpose of imparting to the clearing comb from time to time the necessary up and down motion. The first described automatic clearing by means of moving mechanism immersed in the water is quite impracticable, in particular where, as in most cases, such arrangements are placed in front of or upon the grate bars, as such arrangements are always liable to disturbances in the working, and are rendered inoperative in cold weather; the second described arrangement is equally objectionable on account of the actuating spindle or tooth rack being immersed in the water. In addition, this arrangement is liable to the objection that the constructions are rendered exceedingly expensive on account of the change wheels, reversing mechanism, and other appliances necessary thereto. My improved apparatus, of which several arrangements are shown on the

accompanying drawings, avoids all the above mentioned defects by having all the actuating mechanisms entirely out of the water, and by doing without all change wheels and reversing gear, all the constructions being of the simplest form and capable of being applied to the grating without any appreciable interference with the working.

The essential feature of the invention therefore consists in the use of appliances for clearing the gratings whose actuating mechanisms are entirely out of the water and which effect both the up and down motion of the clearing comb without the use of change wheels and reversing gear.

As the several modifications of the main principle of construction shown on the accompanying drawings indicate, the object aimed at can be attained in various different ways. There is however common to all constructions the feature that the carrying arms of the clearing comb, and the comb itself, can move between the chains actuating the same and the upper chain wheels carrying the chains. With some constructions in which the lower chain wheels are carried by a common shaft which can advantageously serve as driving shaft, the clearing comb can also pass over the latter.

In the accompanying drawings:—Figure 1, is a side elevation of the apparatus in place in the water course, parts being in section. Fig. 2, is a front view of the same the water course being shown in transverse section. Figs. 3 and 4 are similar views of a modified form of apparatus. Figs. 5 and 6 are views similar to Fig. 1 of further modifications. Fig. 7, is a front view of a double form of apparatus adapted to a wider water way shown in cross section. Fig. 8, is a view similar to Fig. 7 of a modified double arrangement.

These various modifications show that the essential principle of my invention may be carried out in various ways without departing from the spirit of the invention.

On the drawings the straining grid or its bars are marked A, the platform against which these bear at top is marked B, the channel bed C, and the sides of the channel D.

In all arrangements of the clearing mechanism, E are the lower chain wheels, F the upper ones, and where there are two sets of these side by side, the additional ones are

marked G; H are the chains, I the clearing comb, K are the arms connecting the latter to the chains, L are the guide rails that support the clearing comb laterally during its upward motion, and M are the guide rails which support the same laterally during its downward motion and allow it to pass downwardly at some distance away from the grating A.

In the arrangement shown in section and front view at Figs. 1 and 2, the lower chain wheels E, are fixed on the transverse driving shaft N, the chains H, being led at top on each side over two chain wheels F, and G. To suitable links of these chains H, are pivoted by means of studs O, the arms K, carrying the clearing comb I. On each side there are attached to the two arms K, or to the clearing comb I, rollers P, which roll upon the guide rails L, and M. Lastly there are provided at a certain distance behind the shaft N, stops Q.

The action of the apparatus is as follows:— On the shaft N, being rotated, the chains H, are caused to travel round the wheels E, F, G, whereby the comb I, is drawn upward over the straining grid A, from the position shown in full lines on the drawings, whereby it is made to carry up all solid matter, which has been deposited against the grid. In order to prevent the teeth of the clearing comb I, from sliding with the excessive friction against the bars A, of the grid, the rollers P, are provided, which during the said upward motion of the comb I, run upon rails L, fixed for this purpose either to the sides D, of the channel or to separate plates. When the clearing comb I, has been raised by the chains H, to such a height that the rollers P, pass off the upper ends of the rails L, the comb I, together with its supporting arms will by the action of gravity, be made to swing backward toward the vertical position, consequently moving toward the platform B. The arm K, will during such swinging motion, come with sufficient force in contact with the stops Q, (as indicated in dotted lines in Fig. 1) to cause all the solid matter carried on the teeth of the comb I, which has not already fallen off of itself to the platform, to be thrown on to the latter by the impetus imparted thereto by the said swinging motion. The clearing comb I, thus relieved of all the matter carried up thereby, will on the continued motion of the chains H, be raised somewhat farther, and, assuming a vertically hanging position, will be carried by the chains H, first from the wheels F, to the wheels G, passing over the upper ends of the rails L, between the chains H, and wheels E, and over shaft N, and as soon as the pivots O, by which the arms K, are suspended from the chains H, have passed the highest point of the wheels G, the clearing comb I, begins to descend again. The rollers P, then pass on to the guide rails M, so that the comb I, will now descend at some distance from the grid A. When the comb I, has arrived in its

lowest position, passing below the lower ends of the rails M, which terminate at some distance from the bed C, it will fall against the lower end of the grid A, and will then begin to travel upward along the same, as before.

Figs. 3 and 4, show a section and front view of a construction in which the lower chain wheels E, instead of being fixed upon a transverse driving shaft, are carried by overhanging axes, like those of the upper chain wheels, F. The second set of upper wheels G, are dispensed with, and rotation is imparted to both the wheels F, from a driving shaft R, by means of chain wheels and chain gearing, or by toothed gearing as shown at Figs. 5 and 8. With this construction there are arranged in a sloping position over the upper ends of the guide rails L, short guide rails T, against which bear the upper ends of movable guide bars U, pivoted to the upper ends of the rails M. In addition there may be provided behind the guide rails T, a fixed comb V, with downward directed teeth, for clearing the teeth of the clearing comb I. The action of this construction is as follows: The clearing comb I, moved upward by the chains H, on losing the support of the rails L, swings backward, until its rollers P, come in contact with the rails T. On rising along these, the comb I, is again moved forward and after passing the pivoted bars U, it begins to descend again, when it is guided by the bars U, on to the guide rails M, along which it descends at some distance from the grating A, as before. As the comb I, rises along the rails T, the teeth of the comb V, enter those of I, and in consequence of the lateral sliding motion of the teeth of I, relatively to those of V, produced by the inclination of the rails T, the teeth of V, are made to strip off any matter that may still adhere to the teeth or in the spaces of I.

Figs. 5 and 6 show two constructions in which the rear guide rails L, are extended upward to such an extent that the rollers P, do not leave them, and consequently the comb cannot swing backward, the forward motion of the comb I, to the guide rails M, being effected entirely by the pivoted guide bars U. Both arrangements show different modes of clearing the comb I. That in Fig. 5, consists of a pivoted comb W which during the upward motion of the comb I, is turned backward into the dotted position, but which, when the comb, I, has nearly reached its highest position moves forward into the position shown in full lines, under the action of the weight 11 in order to enter with the points of its teeth between the teeth of the comb I, as this begins to descend, so that as this at the same time moves forward along the guide bars U, the teeth of the comb W, strip off its teeth and from its spaces the solid matter adhering thereto, causing it to fall on to the platform B.

The clearing arrangement shown at Fig. 6, consists of a comb Y, mounted on pivoted arms X, which by the upward motion of the

clearing comb I, are turned into the dotted position, while on the commencement of the downward and simultaneous forward motion of I, the comb Y, descends with it and in entering between the comb's teeth clears them of adhering matter. The same results will be obtained by mounting the comb Y, in lateral inclined guides in which it can slide up and down, instead of mounting it on pivoted arms.

Fig. 7 shows a front view of a construction described with reference to Figs. 1 and 3 adapted for water channels of greater width, in which all guide rails the lower bearing of the driving shaft N, as also the stops Q, are cast in one with or otherwise fixed to cast iron side cheeks Z, while the upper chain wheels F, G, are fixed to the side walls or to the top inclosure. The cheeks Z, could also be extended upward sufficiently to carry the supports of the upper chain wheels F, and if desired also the wheels G, as indicated at Fig. 8. This figure shows a further arrangement of the apparatus for wide water channels according to the construction described, with reference to Figs. 2 and 5, with the driving gear shown in Fig. 5, the clearing apparatus shown at the left hand side being the same as that at Fig. 5, while that at the right hand side is the same as shown at Fig. 6. Of course in this arrangement, as also in those at Figs. 3, 4, 5 and 6, the lower chain wheels E, might be carried by one and the same transverse shaft, which may then conveniently serve as the driving shaft, as the clearing combs I, in their motion do not move sufficiently far forward to come in contact with such transverse shaft.

Fig. 5 also shows a side view of one of the side cheeks Z, of Fig. 8.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In combination, the straining grid, the clearing comb therefor adapted to move up and down, and operating means for said comb comprising the depending arms and the driving device therefor pivoted at one point at the upper ends of said arms, said driving device operating lengthwise of the depending arms and acting to pull the arms up and to force them down, substantially as described.

2. In combination, the straining grid, the clearing comb therefor, adapted to move up and down, the arms K carrying the comb, and the endless chain connected directly to the said arms, substantially as described.

3. In combination, the straining grid, the clearing comb therefor, capable of moving up and down along said grid the arms K, connected with the said comb, the endless chains to which the arms are pivoted, the upper and lower wheels for said chains, the said upper wheels being supported on short axes to permit the arms K, to pass between them, substantially as described.

4. In combination, the grid, the clearing comb therefor, the inclined endless chain, the arms K, pivotally connected thereto and depending therefrom with the comb, at their lower ends, and the platform B, at the upper part of the grid extending under the inclined chain, substantially as described.

5. In combination, the grid, the comb, the guide rail M arranged at a slight distance from the grid to direct the comb in its downward movement at a slight distance from the grid, and the laterally swinging arms with operating means pivotally connected thereto at their upper ends for raising and lowering the same, the said arms being free to swing laterally over the top of the grid, substantially as described.

6. In combination, the inclined grid, the comb, the arms K, connected therewith, the guiding rail L for the comb, the chains pivotally connected to the arms for elevating the same in inclined position along the rail L, and the inclined guide rail M, the said chains being arranged to move the arms in inclined position downwardly along the said guiding rails M, and below the lower ends thereof whereby the comb will swing to engage the grid, substantially as described.

7. In combination, the grid, the comb with the carrying arms therefor, the chains for reciprocating the said arms connected directly thereto by pivots, the guide rails for directing the upward movement of the comb, the guide rails M, for directing its downward movement and pivoted guide bars U at the upper ends of the guide rails M for directing the comb thereto, substantially as described.

8. In combination, the grid, the comb therefor, the arms K carrying said comb the means for reciprocating said arms, the guide rails L, and M, the supplemental guide rail T, arranged to act as a stop for the swinging arms K when the comb is raised above the ends of the rails L, said supplemental guide rails inclining forward and the pivoted guide bars between the said rails T and the rails M, substantially as described.

9. In combination, the straining grid, the clearing comb therefor, adapted to move up and down, operating means for said comb comprising the depending arms and the driving device therefor pivoted thereto at one point at the upper ends of said arms said driving device operating lengthwise of the depending arms to pull the same up and force them down, said arms being free to swing back and forth and the means for guiding the arms in their movements, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRIEDRICH CÖRRELL.

Witnesses:

FRANZ HASSLACHER,
ERNST UHRIG.