(No Model.) 2 Sheets—Sheet 1.

F. O. MATTHIESSEN.

ADJUSTABLE DAM FOR STARCH TROUGHS.

No. 273,572. Patented Mar. 6, 1883.

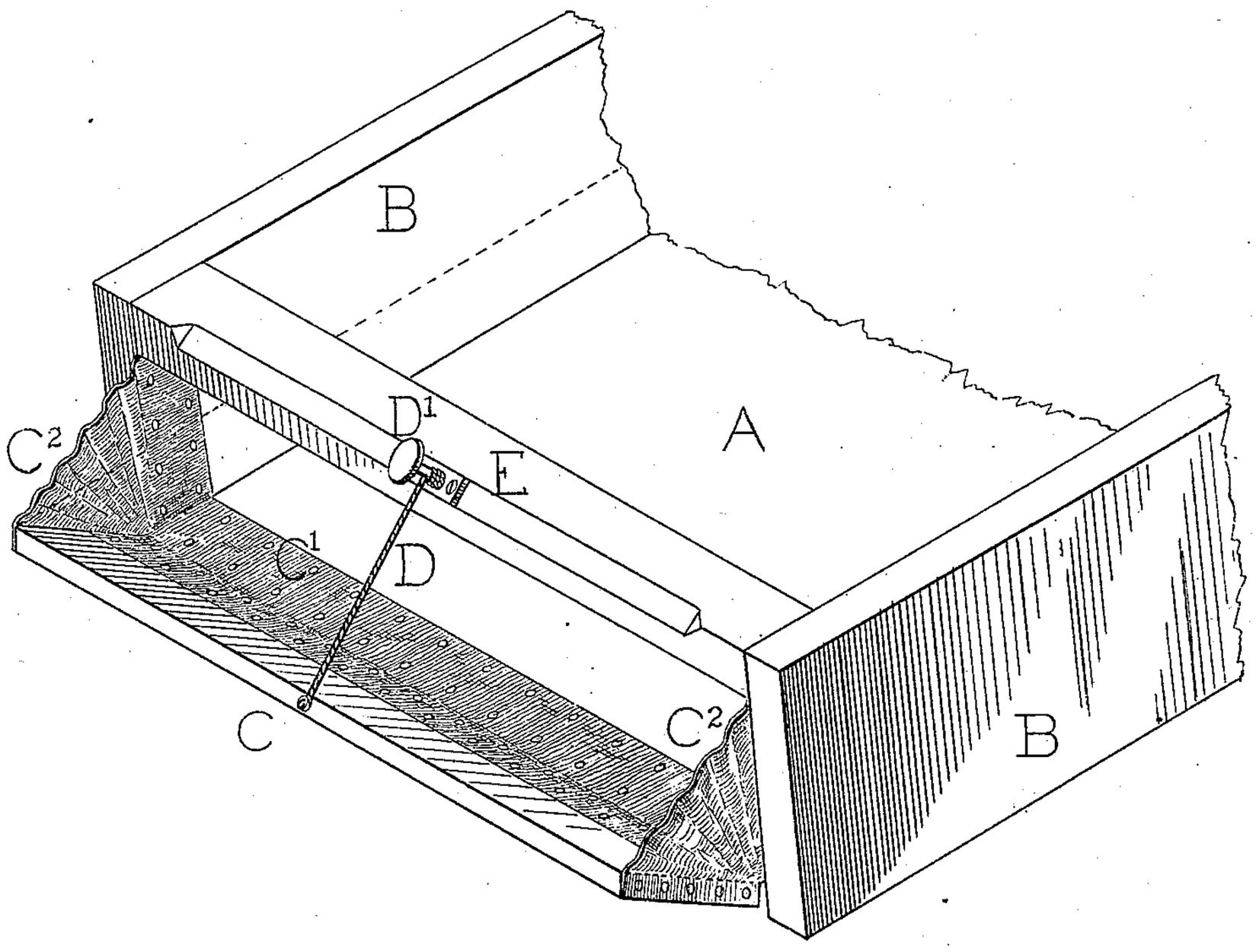

FIG 1.

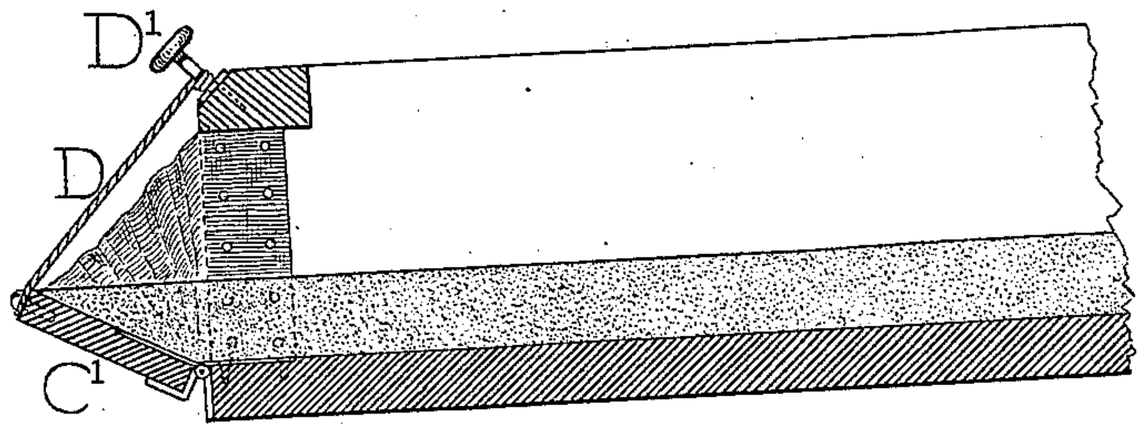

FIG 2

WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

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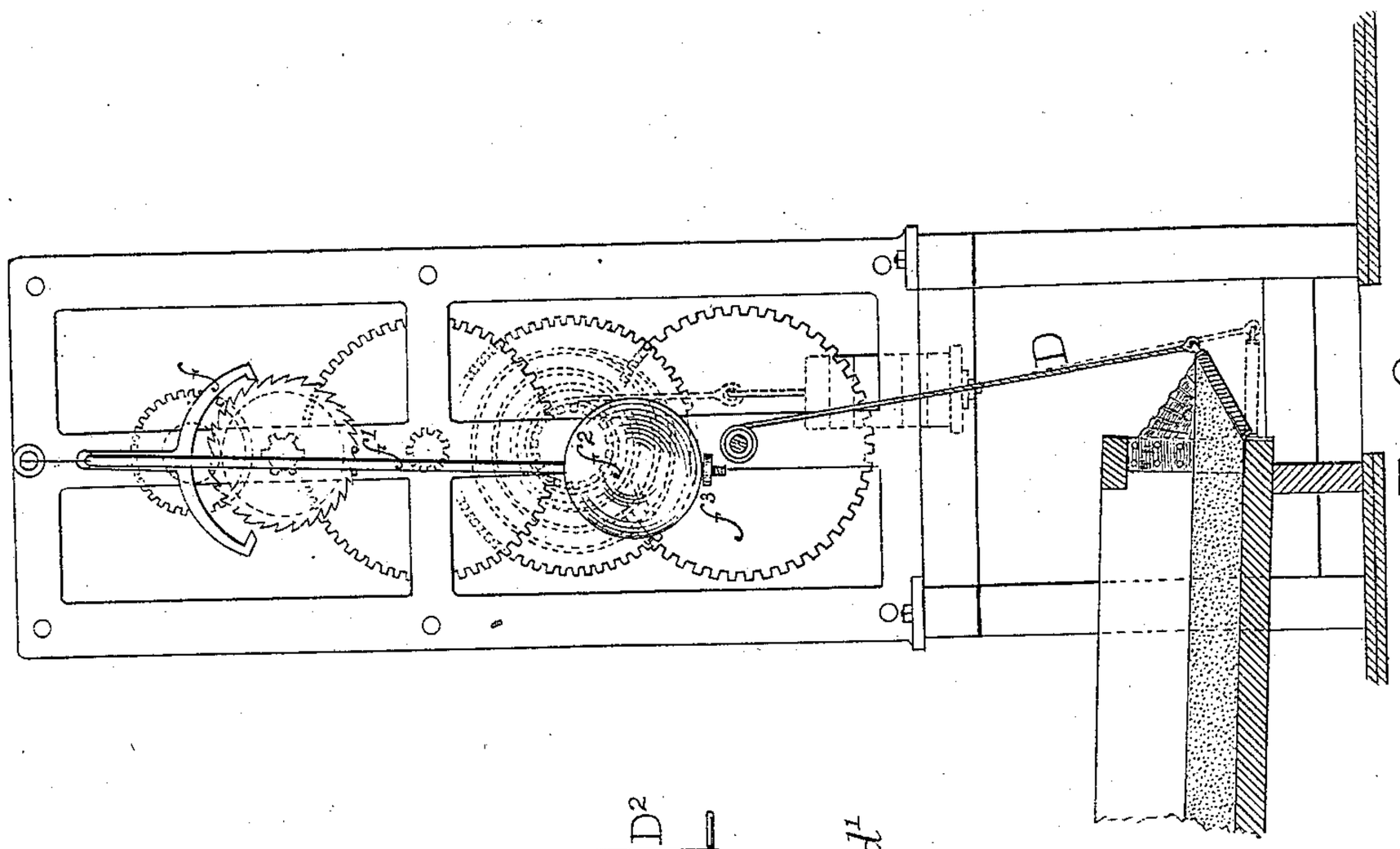

FIG 3.

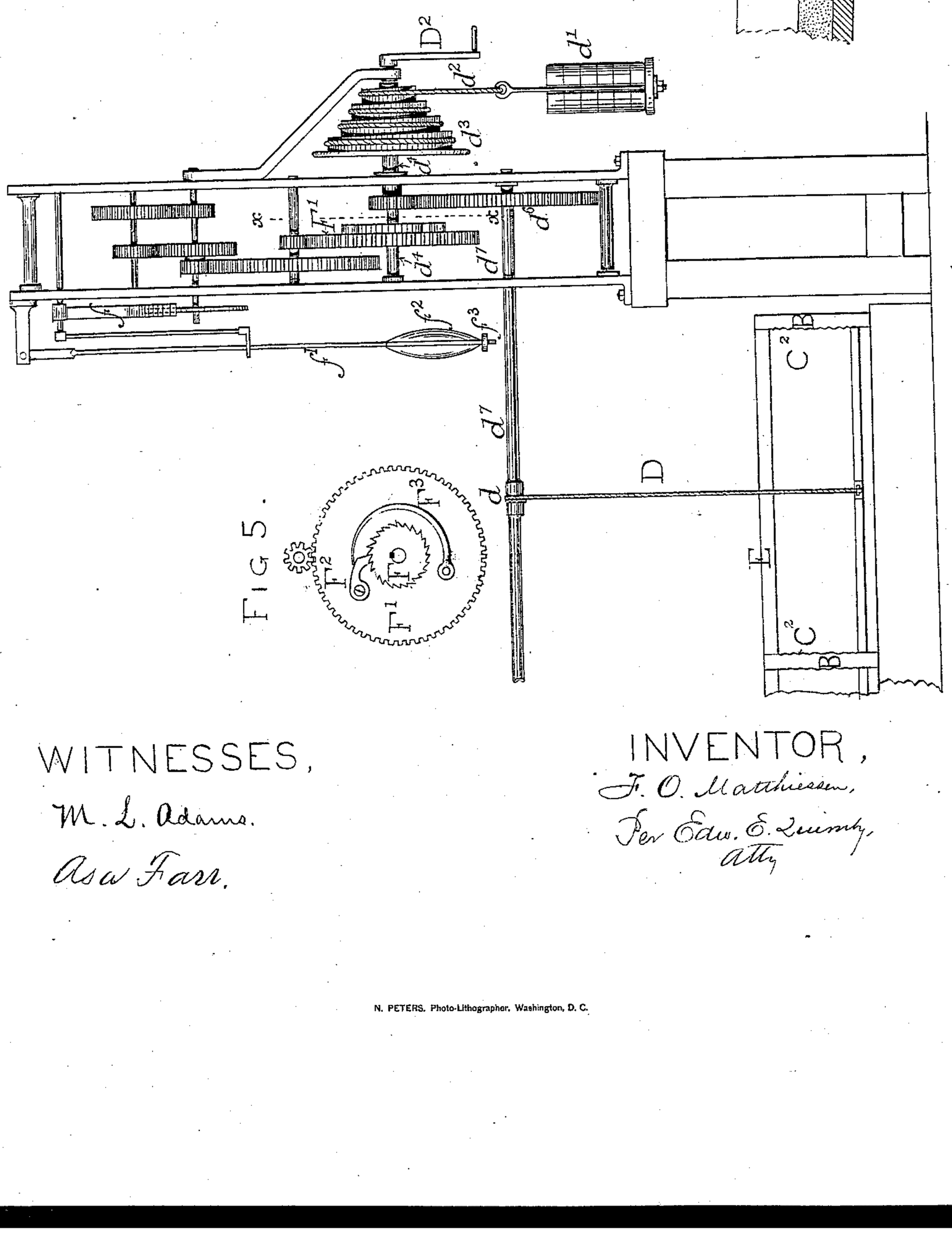

FIG 4.

FIG 5.

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UNITED STATES PATENT OFFICE.

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ADJUSTABLE DAM FOR STARCH-TROUGHS.

SPECIFICATION forming part of Letters Patent No. 273,572, dated March 6, 1883.

Application filed January 20, 1883. (No model.)

To all whom it may concern:

Be it known that I, FRANZ O. MATTHIESSEN, of Irvington, New York, have invented certain Improvements in Adjustable Dams for Starch-Troughs, of which the following is a specification.

My invention embraces two objects. One is the prevention of leakage through the joint between the lower end of a starch-trough and the movable dam for regulating the height of the overflow from the trough, and the other is the regulation of the height of the overflow from starch-troughs by apparatus which operates automatically. My first object is accomplished by providing the lower end of the trough with a hinged board, like the tail-board of a wagon, and covering the joint between the board and the bottom of the trough with a web of flexible water-tight material, and connecting the ends of the tail-board with the ends of the sides of the trough by webs of flexible material, which are also water-tight. Dams so constructed and provided with means by which they can be elevated and lowered may be operated by manual power; or they may be operated by any suitable power which works with the necessary regularity—such as would be furnished, for example, by a weight or spring operating to turn a windlass upon which is wound the cord for lifting the dam, the windlass-shaft being geared to a clock-work escapement for regulating the speed of rotation of the windlass; or the same object can be accomplished by gearing down to the windlass-shaft by means of the worm-gear from a line-shaft kept in motion by any suitable motor.

The accompanying drawings, illustrating a starch-trough provided with my invention, are as follows:

Figure 1 is an isometrical perspective of the lower end of the trough, showing the tilted dam affixed thereto and a lifting-cord wound upon a wrest-pin for operation by manual power. Fig. 2 is a longitudinal vertical section of the lower end of the trough. Fig. 3 is a section of a starch trough and dam similar to that shown in Fig. 2, and a front elevation of clock-work mechanism for operating the windlass upon which the lifting-cord is wound. Fig. 4 is an elevation of the rear end of the starch-trough, exhibiting the clock-work mechanism in side elevation. Fig. 5 is a section taken through the line *x x* on Fig. 4, showing a portion of the clock-gearing.

Referring to the drawings, the bottom A of the trough has the usual inclination, and its sides B B are of the usual height.

The dam or tail-board C is hinged to the bottom of the trough, and the joint between the tail-board and the bottom of the trough is covered by the web of flexible material C′. Webs C^2 C^2, of similar material, are affixed to the ends of the tail-board and to the ends of the sides B B of the trough, overlapping the sides sufficiently to make a water-tight joint. The webs C^2 are collapsible, and are of such dimensions as to permit the tail-board to drop down until its upper surface lies in the same plane as that of the bottom of the trough. The tail-board is tilted upward by means of the lifting-cord D, which, when the tail-board is to be lifted by manual power, may be fastened to a wrest-pin, D′, inserted into the strut E, which extends across the top of the trough at its lower end. In such case the attendant, who observes the progress of the starch deposition upon the bottom of the trough, from time to time elevates the tail-board, as may be required. As, however, the deposit of starch upon the bottom of the trough has a definite rate of increase, according to the density of the starch-milk and the inclination and dimensions of the trough, I have devised the plan of operating the tail-board, and thereby regulating the height of the overflow from the lower end of the starch-trough, by means of power so applied as to automatically effect the necessary gradual elevation of the tail-board as the starch deposit gradually increases in amount. For illustration, assuming that twelve hours are required for the formation of a starch deposit which at the lower end of the trough is, say, four inches in thickness, the tail-board will be required to rise at the rate of one-third of an inch per hour. To effect this rise I fasten the upper end of the lifting-cord D to a windlass, *d*, rotated by means of the weight *d′*, suspended by a rope, d^2, wound upon the fusee d^3, which is fastened to a counter-shaft, d^4, carrying a pinion, d^5, which meshes into the cog-wheel d^6, keyed to the windlass-shaft d^7. The

counter-shaft d^4 has keyed to it the ratchet-wheel F, and loosely hung upon it the gear F′, provided with a pivoted detent-pawl, F^2, held in engagement with the teeth of the ratchet-wheel F by the spring F^3, so that when the shaft d^4 is being rotated during the operation of raising the tail-board motion will be transmitted to the gear F′, and thence, through a suitable train of gearing, to an ordinary anchor-escapement governed by the pendulum f', the weight f^2 on the lower end of which is made vertically adjustable, in the usual way, by means of the nut f^3. The fusee counter-shaft d^4 is provided with the crank D^2, by means of which the weight may be wound up when required. It will be seen that when the shaft d^4 is turned in the proper direction to wind up the cord d^2, by which the weight is suspended, the detent-pawl F^2 yields, allowing the ratchet-wheel F to be turned without turning the gear F′. The object in using the fusee for winding up the rope by which the weight is suspended, and in fastening this rope to the part of the fusee which is of the largest diameter, is to give the lifting mechanism a gradual increase in power as the starch deposit increases in thickness, because as such deposit increases in thickness greater force will be required to lift the tail-board.

Variable weights may of course be suspended upon the cord d^2, according to the amount of power required for raising the tail-board; but with a given weight the fusee affords a means of adjusting this power, which is effected by varying the number of turns in winding up the weight, so that it shall act upon a larger or smaller part of the fusee.

Any of the various well-known forms of escapements or governors may be employed to regulate the speed of rotation of the windlass-shaft, and instead of effecting a regular increment in the power expended in turning the windlass, there may be employed a weight or power largely in excess of that required to lift the tail-board, so that the additional force required to lift the tail-board after the starch deposit has formed upon it will be comparatively too small to affect the regularity of movement of the windlass.

The windlass-shaft d^7 may be employed in connection with a single starch-trough, or may be prolonged and be provided with a series of windlasses for operating the tail-boards of a series of adjoining troughs, the additional power required being applied to the windlass-shaft.

I claim as my invention—

1. The herein-described adjustable mechanism for regulating the height of the overflow from the bottom of a starch-trough, consisting of a tail-board hinged across the lower end of the bottom of the trough, and connected with the bottom and sides of the trough by webs of collapsible or flexible material, and means for holding the tail-board at different elevations.

2. Mechanism for automatically regulating the height of the overflow from the bottom of a starch-trough, consisting of a vertically-movable dam, a suitable device for gradually elevating the dam, operated by power transmitted through a rotating shaft, and a governor for keeping the speed of rotation of such shaft at a prescribed rate, whereby the gradual rise of the dam is made to be concurrent with the gradual increase in thickness of the deposit of starch upon the bottom of the trough.

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