No. 808,800. PATENTED JAN. 2, 1906.

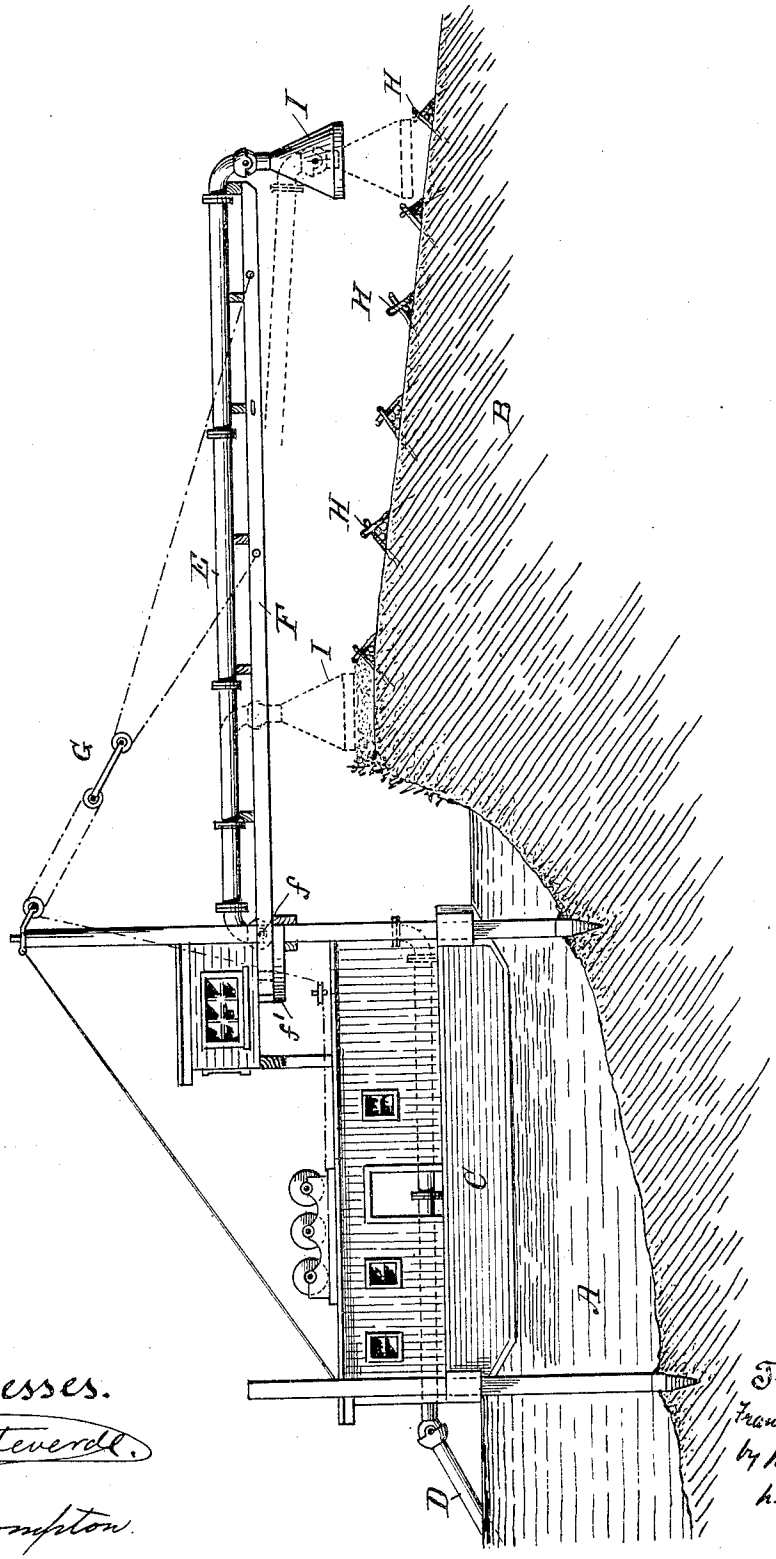
F. V. WRIGHT.

LEVEE BUILDING SUCTION DREDGE.

APPLICATION FILED OCT. 9, 1905.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

H. Montevercl.

J. Compton.

Inventor.

Frank V. Wright

by Wm. F. Booth

his Attorney.

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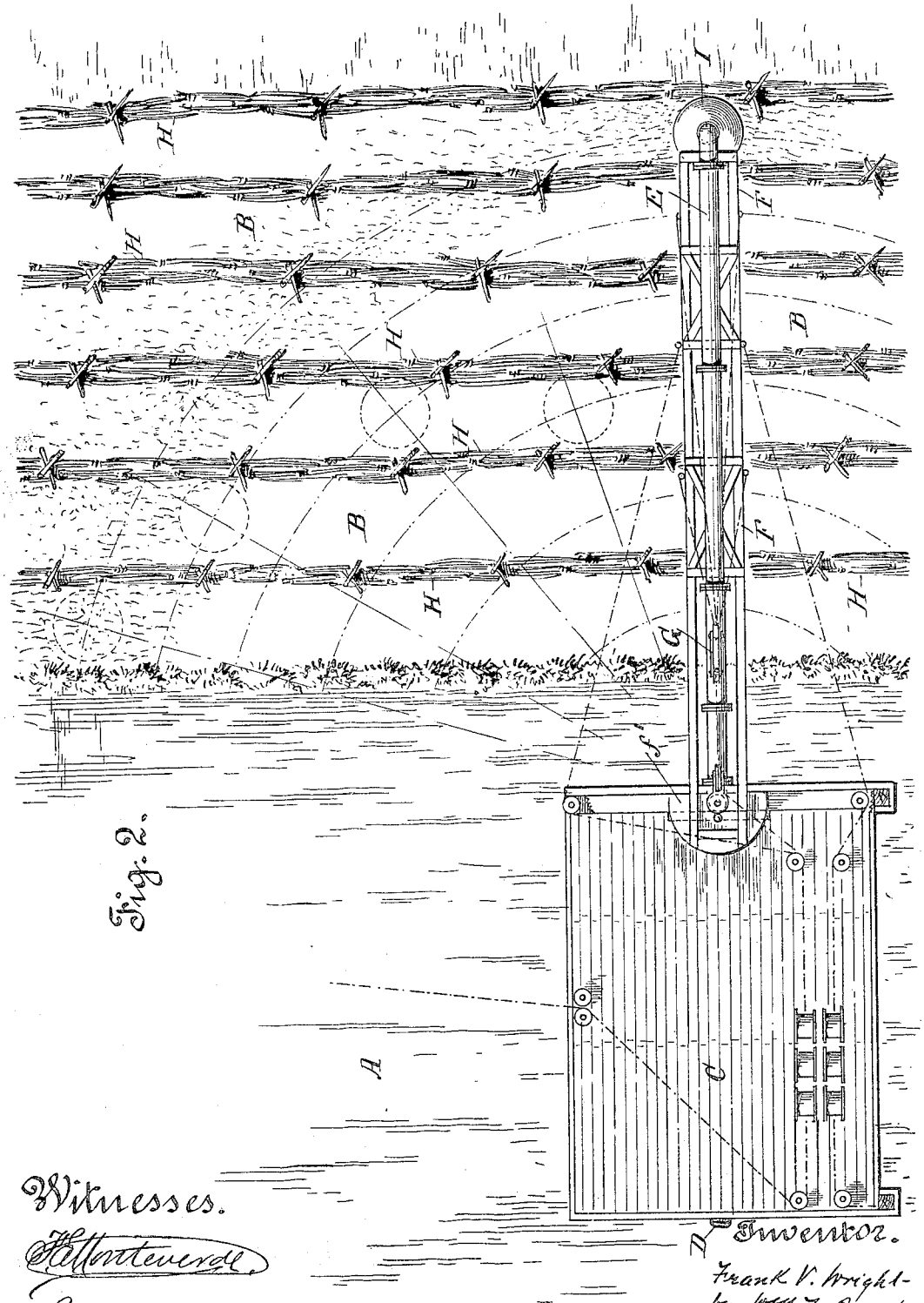


Fig. 2.

Witnesses.

H. Montevercle

J. Compton

Inventor.

Frank V. Wright

by Wm. F. Booth

his Attorney.

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APPLICATION FILED OCT. 9, 1905.

3 SHEETS—SHEET 3.

Fig. 3.

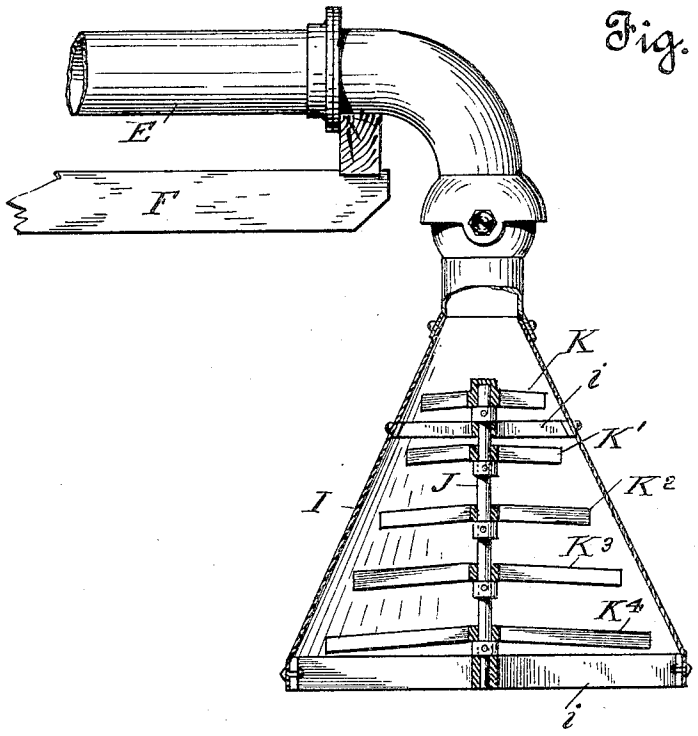


Fig. 4.

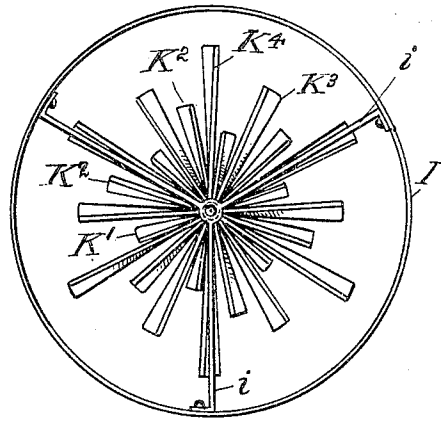
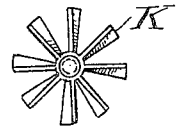


Fig. 5.



Witnesses.

H. Montevercle.

L. Compton.

Inventor.

Frank V. Wright

by Wm. F. Booth

his Attorney.

UNITED STATES PATENT OFFICE.

FRANK V. WRIGHT, OF SAN FRANCISCO, CALIFORNIA.

LEVEE-BUILDING SUCTION-DREDGE.

No. 808,800. Specification of Letters Patent. Patented Jan. 2, 1906.

Application filed October 9, 1905. Serial No. 281,906.

To all whom it may concern:

Be it known that I, FRANK V. WRIGHT, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Levee-Building Suction-Dredges; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of suction-dredgers and to a dredge of this class which from its use may be aptly termed a "levee-building" dredge.

As is well known, the suction-dredge in addition to its primary use of improving rivers and harbors by deepening them is of great utility in filling up marshes, swamps, and other low places and building moles, abutments, dikes, and levees. In the last-named work—that is, levee-building—it is obvious that both functions of the dredge are exercised, for the river may be improved and its levees built by the single use of the machine. The work of levee-building with a suction-dredge is therefore of great importance. To the necessities of this work my invention is directed; and it has for its object what may be termed an improved "shore distribution" of the levee-building material supplied by the dredge. This distribution includes both the proper delivery of the material with respect to force and velocity and its most advantageous spread with respect to area and uniformity. These objects, together with the means by which they are attained, will be fully appreciated from the following description, assisted by the accompanying drawings, in which—

Figure 1 is a side elevation of as much of a suction-dredge as is necessary to indicate its character, said dredge being shown in position for levee-building, its delivery-pipe being provided with my improved shore distributer. Fig. 2 is a plan view of the same. Fig. 3 is a vertical section, enlarged, of the shore-distributer. Fig. 4 is a bottom plan view of the same. Fig. 5 is a top plan of the uppermost obstructing-wheel K in the shore distributer.

Referring to Fig. 1, A is the river, and B is the bank or levee being built, augmented, or repaired. C is a dredge of the suction type, though I have not deemed it necessary to show its excavator and other related parts, as these form no part of my invention. I have thought it only necessary to show by the suction-pipe B and the delivery-pipe E that the dredge is of the class which is adapted to excavate, stir up, and mix the mud from the river-bottom with water, to suck up the water with the mud in suspension, and to deliver what may be called the "liquid mud" to the levee to be built. The delivery-pipe E is carried by a crane F, which is hinged at *f* in a manner to permit its end to be swung in a vertical arc, and is hinged at *f'* in a manner to provide for said outer end to swing in a horizontal arc. These connections need merely be indicated, as their details are immaterial. For the same reason it need only be stated that the delivery-pipe E is properly jointed at its inner end to its connections to permit it to be moved up and down and horizontally by the crane. Also the operating connections (generally designated by G) need no further description than is indicated by their designating-letter.

In building or adding to or strengthening a levee by the use of liquid mud from a suction-dredge the custom is to establish some kind of barriers on the bank or levee to form boundary-walls by which the liquid mud is confined to permit a separation of the water from the mud. The delivery-pipe is then directed into the area bounded by these barriers, and the liquid mud is supplied to said area until enough earth when the water is withdrawn is thus placed on the levee to accomplish the needed construction, augmentation, or repair. I have discovered two serious defects in this custom, which defects grow out of the delivery of the liquid-mud under a velocity highly injurious and even destructive to the confining-barriers and the delivery of said mud without due regard to a uniform spread or distribution. The first of these difficulties is the more pronounced where the barriers are initially frail. For example, I refer to the barriers of my pending application, Serial No. 278,140, filed September 12, 1905, which are made initially of bundles of willow stems and stalks laid upon the bank or levee and staked there, the intention being to have the willows grow, the bundles being embedded in the mud, which when first supplied in suspension in water permeates their interstices. When the willows are grown, they form levee-binders, protectors, and future barriers. When these willow bundles are first laid and staked out, they are not

very firmly placed, nor are they strong or very coherent in themselves. Consequently to deliver the liquid mud under the velocity and with the force with which it usually comes from the suction-dredge tears these frail barriers out and is very destructive to them.

My invention contemplates the decided reduction of the velocity of delivery, and the discharge of the material gently upon the levee or bank in the area bounded by the barriers.

In Figs. 1 and 2 I have shown on the bank or levee B a number of parallel lines of barriers H, which may be supposed to consist of the willow bundles of my application above referred to.

To the discharge end of the delivery-pipe E is fitted a means of some suitable character adapted to reduce the velocity of the material being discharged. A good device for this purpose is the flaring-spreader I, in which are seated obstructions of some nature. These obstructions may be bars fixed or movable, though the construction deemed by me best suited for the purpose is that shown in Figs. 3 and 4. In the spreader I is mounted centrally by braces *i* a vertical spindle J. Rotatably mounted upon this spindle is a vertical series of obstructing-wheels. The uppermost, K, of the series comprises blades radiating from a hub mounted and freely revoluble on the spindle J, said blades having their surfaces inclined or beveled in one direction. The next lower, K′, is similarly constructed and mounted, but has a greater diameter and its blades are inclined in the other direction. The third, K^2, is still larger and has its blades inclined in the first direction. The fourth, K^3, has a still greater diameter and its blades are inclined as are those of the second. The fifth, K^4, is the largest, and its blades are inclined as those of the first. All the wheels have their blades directed downwardly on a gentle slope to avoid tendency to clog. There may be of course any number of obstructing-wheels in the series. The series of wheels is thus a vertical one, each wheel independently revoluble and gradually increasing in diameter. The effect of the flaring spreader and the obstructing-wheels therein is to check the velocity of the discharge and by the rotation of the wheels under the falling impact or pressure of the material, said rotation being in opposite directions in adjacent wheels, to thoroughly spread the material out and to uniformly deliver it over an area equal to that of the mouth of the spreader, which is very much greater than that of the usual delivery-orifice.

It will now be seen by reference to Fig. 1 that the delivery-pipe E extends over and above the levee, and its spreader I can by the vertical swing of the crane F be lowered into close relation to the levee, and the retarded material can be very gently discharged upon the levee over a considerable area without tending in the least to tear out or injure even the frailest barrier or to cut the levee up in any manner. To swing the spreader I through a horizontal arc, it can be lifted by the crane F to fully clear every part of the levee, structure swung to a new position, and again lowered for gentle delivery.

By referring to Fig. 2 the effect of swinging the delivery-pipe E in a horizontal arc can be appreciated. By successive movements in said arc the several spaces between barriers can be supplied to such practical extent as may be found best, and then when the dredge is moved by its spuds to a new position the delivery can be continued in said spaces to an additional extent, and so on, by swinging the delivery-pipe over the levee, all as indicated by the dotted lines. By such continued delivery, aided by the relatively large mouth of the spreader itself, the general discharge of levee-building material is gentle, extensive, and uniform, thus fulfilling the requirements of the work when using a suction-dredge.

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

1. In a levee-building suction-dredge, a delivery-pipe disposed above the levee, and suspended from the dredge by connections which enable its discharge end to be swung over the levee in a horizontal arc.

2. In a levee-building suction-dredge, a delivery-pipe disposed above the levee and suspended from the dredge by connections which enable its discharge end to be swung toward or raised from the levee in a vertical arc.

3. In a levee-building suction-dredge, a delivery-pipe disposed above the levee, and suspended from the dredge by connections which enable its discharge end to be swung over the levee in a horizontal arc, and to be swung toward or raised from the levee in a vertical arc.

4. In a levee-building suction-dredge, and in combination with its delivery-pipe, a means in connection with the outlet of said pipe for reducing the velocity of the material at the outlet.

5. In a levee-building suction-dredge, and in combination with its delivery-pipe, a means in connection with the outlet of said pipe for reducing the velocity of the material at the outlet and spreading it at said outlet to a delivery area greater than that of the pipe itself

6. In a levee-building suction-dredge, and in combination with its delivery-pipe, obstructions in the outlet of said pipe for reducing the velocity of the material at said outlet.

7. In a levee-building suction-dredge, and in combination with its delivery-pipe, obstructions in the outlet of said pipe for

reducing the velocity of the material at said outlet consisting of a revolubly-mounted wheel with radial blades rotatable under the pressure of said material.

8. In a levee-building suction-dredge, and in combination with its delivery-pipe, a flaring spreader fitted to the outlet end of said pipe, and obstructions in said spreader for reducing the velocity of the material discharging therefrom.

9. In a levee-building suction-dredge, and in combination with its delivery-pipe, a flaring spreader fitted to the outlet end of said pipe, and obstructions in said spreader for reducing the velocity of the material discharging therefrom consisting of a revolubly-mounted wheel with radial blades rotatable under the pressure of said material.

10. In a levee-building suction-dredge, and in combination with its delivery-pipe, a flaring spreader fitted to the outlet end of said pipe, and obstructions in said spreader for reducing the velocity of the material discharging therefrom consisting of a series of independently revolubly mounted wheels with radial blades, the blades of one wheel being inclined oppositely to those of the adjacent wheel, whereby adjacent wheels are rotated in relatively opposite directions by the pressure of the discharging material.

11. In a levee-building suction-dredge, a delivery-pipe disposed above the levee and suspended from the dredge by connections which enable its discharge end to be swung horizontally and vertically over the levee, in combination with a spreader fitted to the outlet of said pipe, and obstructions in the spreader for reducing the velocity of the discharging material.

12. In a levee-building suction-dredge, a delivery-pipe disposed above the levee and suspended from the dredge by connections which enable its discharge end to be swung horizontally and vertically over the levee, in combination with a spreader fitted to the outlet of said pipe, and obstructions in the spreader for reducing the velocity of the discharging material consisting of a revolubly-mounted wheel with radial blades rotatable under the pressure of said material.

13. In a levee-building suction-dredge, a delivery-pipe disposed above the levee and suspended from the dredge by connections which enable its discharge end to be swung horizontally and vertically over the levee, in combination with a spreader fitted to the outlet of said pipe, and obstructions in the spreader for reducing the velocity of the discharging material consisting of a revolubly-mounted wheel with radial blades rotatable under the pressure of said material, consisting of a series of independently revolubly mounted wheels with radial blades, the blades of one wheel being inclined oppositely to those of the adjacent wheel, whereby adjacent wheels are rotated in relatively opposite directions by the pressure of the discharging material.

In witness whereof I have hereunto set my hand.

FRANK V. WRIGHT.

Witnesses:

J. COMPTON,

D. B. RICHARDS.