

(No Model.)

3 Sheets—Sheet 1.

W. K. KAVANAUGH.
DREDGING MACHINE.

No. 583,259.

Patented May 25, 1897.

Fig. 1.

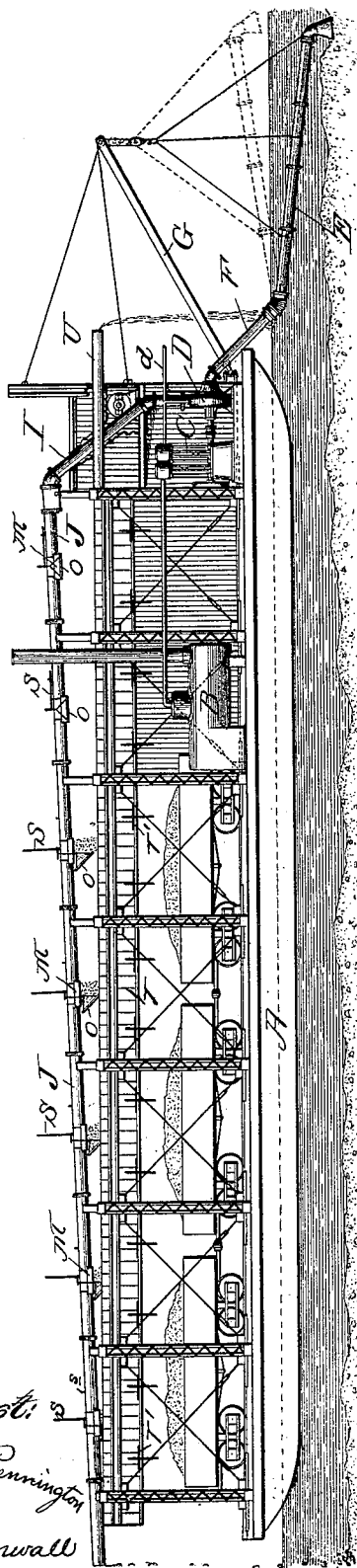


Fig. 2.

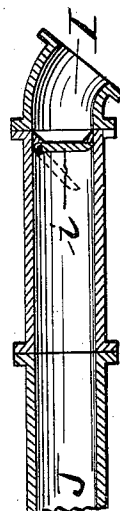
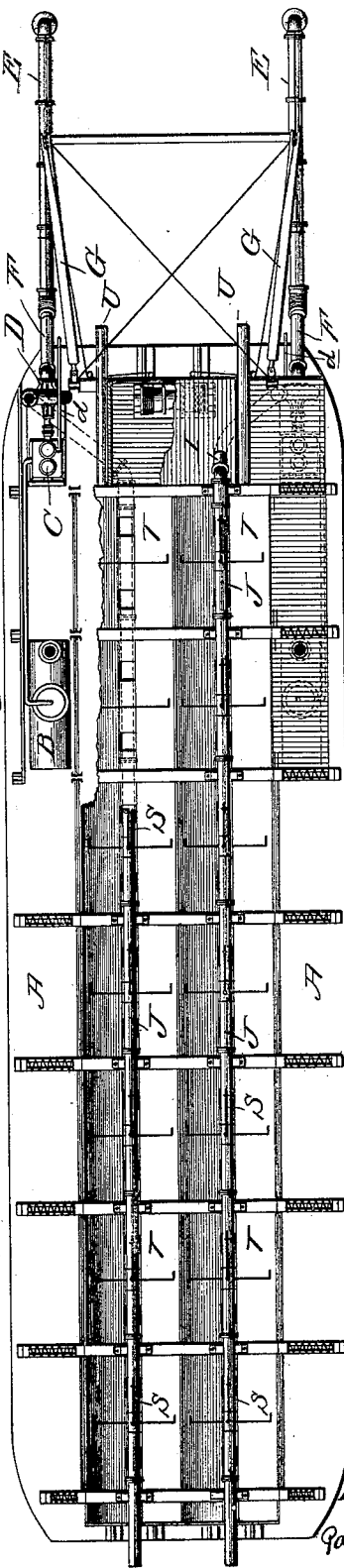


Fig. 10.

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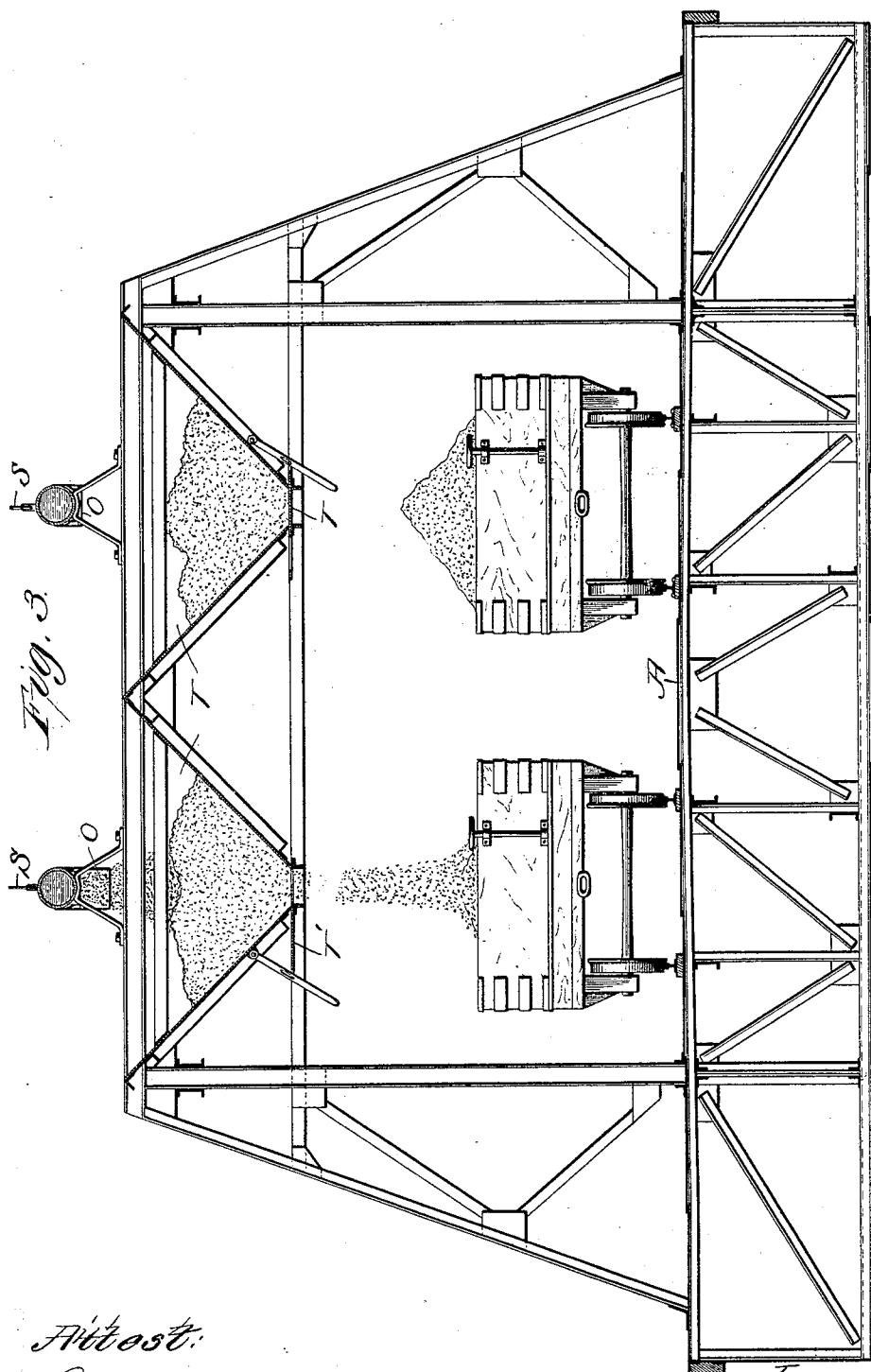
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3 Sheets—Sheet 2.

W. K. KAVANAUGH.
DREDGING MACHINE.

No. 583,259.

Patented May 25, 1897.



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J. R. Cornwall

Inventor:
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By Paul Bakewell Atty.

UNITED STATES PATENT OFFICE.

WILLIAM K. KAVANAUGH, OF ST. LOUIS, MISSOURI.

DREDGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 583,259, dated May 25, 1897.

Application filed September 16, 1896. Serial No. 606,008. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM K. KAVANAUGH, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Dredging-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a side elevational view of my improved dredging-machine. Fig. 2 is a top plan view of the same. Fig. 3 is an enlarged cross-sectional view. Fig. 4 is a side elevational view of a conduit, showing the screen-blind up in position. Fig. 5 is a similar view showing the screen-blind in its lowered position and part of the conduit broken away to show the screen within. Fig. 6 is a cross-sectional view through the conduit and screen, taken on line 6 6, Fig. 4. Fig. 7 is a top plan view of part of the screen casting or support and screen. Fig. 8 is a sectional view taken on line 8 8, Fig. 7. Fig. 9 shows a slightly different means for supporting the screen. Fig. 10 is a detail view of the valve-casing and flap-valve at the front end of the conduit-pipe.

This invention relates to a new and useful improvement in dredging-machines, and it is designed particularly for use in dredgingsand from the bottoms of rivers, said sand being pumped, together with a suitable quantity of water to render it "fluid," through conduits or pipes, which are provided with screens at intervals. The sand passing through these screens falls into a trough, where it settles, the water floating off, whence the same may be precipitated into a suitable vehicle, such as a railway-car, dump-car, or wagon, under the troughs. Foreign particles too large to pass through the screens are permitted to travel through the conduits to the back of the vessel, where they are again returned to the river. The hull and troughs are preferably constructed of steel, suitably braced and supported, and suitable machinery is arranged at the forward end of the vessel to control the suction ends of the pipes and also to operate the pump.

Heretofore the method of dredgingsand has been to discharge the sand and water from

suitable pumping machinery onto a scow, the water being permitted to run off. The sand was then carried to the shore and loaded upon carts or wagons, which delivered it at desired points. By reason of the necessity for frequently handling sand in this manner of dredging it is too costly to load railway-cars for the purpose of transporting sand to any distance. The hull of my dredger is of sufficient size and strength to sustain railway-cars, so that the same may be carried on the hull out into the river and loaded directly without requiring any manual handling of the sand.

With these objects in view the invention consists in arranging upon a suitable hull machinery for pumping sand and water into troughs, said troughs being elevated above the hull and provided with gates whereby sand may be taken from any point along the length of the trough and precipitated into suitable means of transportation located beneath.

Another feature of the invention resides in the construction of the screen, its manner of support, and the means for blinding said screen.

Other features reside in the construction, arrangement, and combination of the several parts, all as will hereinafter be described, and afterward pointed out in the claims.

In the drawings, A indicates the hull, which is preferably constructed of steel and suitably braced.

B indicates boilers, of which there are preferably two, one being located on each side of the hull and at the forward end of the same, said boilers being adapted to develop steam to run engines C, which are preferably directly connected to pumps D.

d indicates siphon-pipes for the pumps.

E indicates a suction-pipe having a funnel-shaped mouth and connected by a flexible joint to a pipe F, leading to the pump-casing. This suction-pipe is raised and lowered by a power-driven drum which is controlled by suitable levers. (Not shown.)

G indicates a boom provided at its end with a sheath, over which the tackle of the hoisting mechanism from the drum passes.

The above description refers to but one side of the device, but is equally applicable

to the other, both sides being substantially duplicates of each other.

Leading from the pump-casing is a pipe I, which delivers the sand and water from the pump into a conduit J, which is graded toward the stern of the vessel. A flap-valve *i* (see Fig. 10) is arranged at the upper end of the pipe I, which is adapted to be closed when the siphon-pipes *d* are operating to initially exhaust the pumps. This conduit is formed with openings in its bottom at suitable points along its length, into which openings are introduced screens which are preferably of the construction shown in Figs. 4 to 8. These screens consist of bars K, arranged longitudinally of the conduit, said bars being interrupted in their length by the formation of eyes *k*, through which eyes pass rods or bolts L, bent to shape of the bottom of the conduit and headed at each end to bind the bars together. From the above construction it will be seen that the eyes in the bars determine the space between each bar and at the same time afford a convenient means by which the bars may be secured together.

M indicates a suitable "box-casting," as I will term it, which is secured to the conduit by straps or rods *m*. These boxes are open at their bottom, and the screens, composed of the rods K and eyebolts or rods L, are introduced from the bottom, as shown in Fig. 6, said screens being supported in position by straps or bars N, bolted to the sides of box M and supporting the screen at its edges. In Fig. 9 I have shown bolt N' as a through-bolt, whereby said bolt supports the screen at its middle and prevents sagging.

O indicates a blind or hood which is adapted to fit against the under side of the box-casting M and prevent the sand and water from falling through the screen or going beyond the box-casting.

P indicates strap-irons which are substantially U-shape and pass under the blinds O, the ends of said strap-iron extending up the sides of the blind near each end thereof, where they have attached to them links Q, said links being secured at their upper ends and attached to a chain R, which is connected to the end of one member of a bell-crank operating-lever S, pivoted on top of the conduit. These links Q and chains R are duplicated on each side of the blind. A suitable catch *s* is arranged on the conduit for holding the operating-lever in such position that the blind will be against the box-casting, as shown in Fig. 4. When the lever is released and thrown to the position shown in Fig. 5, the blind will be lowered to permit the sand and water to pass through the screen from the conduit at that point. In this manner the loading of the troughs is controlled so that the sand may be equally distributed throughout the length of the trough by blinding some of the screens and opening others, as the case may require.

The conduit is open at its rear end, as

shown in Fig. 1, so that articles introduced into the conduit which are too large to pass through the screens can fall back into the river.

T indicates V-shaped troughs elevated above the hull of the vessel, said troughs being supported and braced by a suitable superstructure, which is preferably composed of steel girders, the bottoms of the troughs being formed with openings at short distances apart, which openings are controlled by gates T', so that sand may be withdrawn from the trough at any point in their length. A pipe U is preferably arranged at the forward end of the vessel to carry off the overflow of water from the trough.

It is obvious that wagons can be loaded from the troughs without manually handling the sand, as can also railway or dump cars, the former of which I have shown, there being suitable tracks arranged on the hull of the vessel, as is well understood.

I am aware that many minor changes in the construction, arrangement, and combination of the several parts of my invention can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a sand-dredging machine, the combination with a suitable hull, of a superstructure arranged thereon, a trough, supported by said superstructure, gates arranged at different points along the bottom of said trough, a conduit which is inclined or graded toward the stern of the hull, said conduit being arranged above said trough, screens in the bottom of said conduit, and at different points in its length, means for blinding, or opening, individual screens, and a pump for introducing sand and water into the highest part of the conduit; substantially as described.

2. The combination with a conduit-pipe of a sand-dredging machine, of a box-casting, a screen composed of bars formed with eyes in their length, tie-bars which pass through said eyes for securing the screen-bars together, bars bolted to the sides of the box-casting for supporting the side edges of the screen, and a blind; substantially as described.

3. The combination with a conduit-pipe of sand-dredging machines, of a box-casting, a screen in said box-casting, said screen comprising parallel bars formed with eyes in their length, tie-bars which pass through said eyes for securing the screen-bars together, said tie-bars being curved to conform to the cross-sectional contour of the conduit-pipe, a blind which is adapted to cover the bottom of the box-casting, a bell-crank operating-lever for said blind, and a chain-and-link connection between the end of one of the members of said bell-crank lever and the blind; substantially as described.

4. In a sand-dredging machine, the combination with a suitable hull, of a superstructure arranged thereon, parallel V-shaped troughs, supported by said superstructure, gates arranged at different points along the bottoms of said troughs, conduits arranged above said troughs, which conduits are inclined or graded toward the stern of the hull, the rear ends of said conduits being open for the passage of material too large to pass through the screens, screens in the bottoms of said conduits and at different points in their length, means for blinding or opening individual screens, and suitable machinery for sucking up sand and water and placing it in the highest part of the conduits; substantially as described.

5. The combination with a conduit-pipe of

a sand-dredging machine, of a box-casting, a screen composed of bars formed with eyes in their length, tie-bars which pass through said eyes for securing the screen-bars together, bars bolted to the sides of the box-casting for supporting the side edges of the screen, and through-bolts for securing said bars to the sides of the box, said through-bolts supporting the screen at its middle; substantially as described.

In testimony whereof I hereunto affix my signature, in presence of two witnesses, this 10th day of September, 1896.

WILLIAM K. KAVANAUGH.

Witnesses:

HUGH K. WAGNER,
F. R. CORNWALL.