

(No Model.)

A. McDOUGALL.

METHOD OF TRANSPORTING SAND, &c.

No. 397,741.

Patented Feb. 12, 1889.

Fig 1.

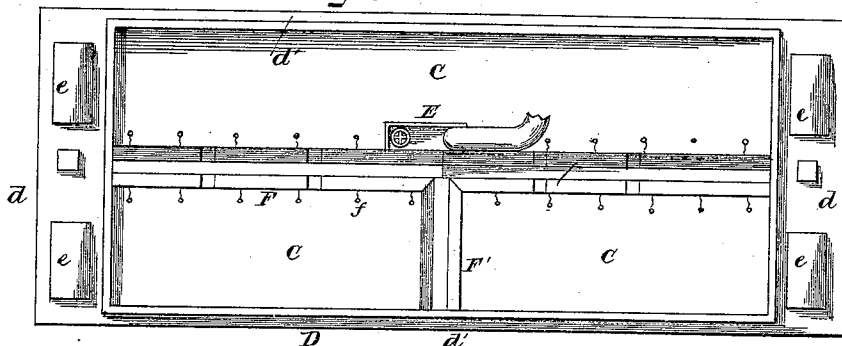


Fig 2.

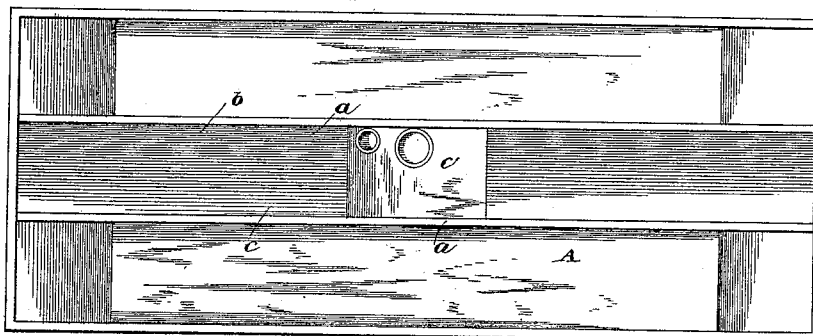


Fig 3.

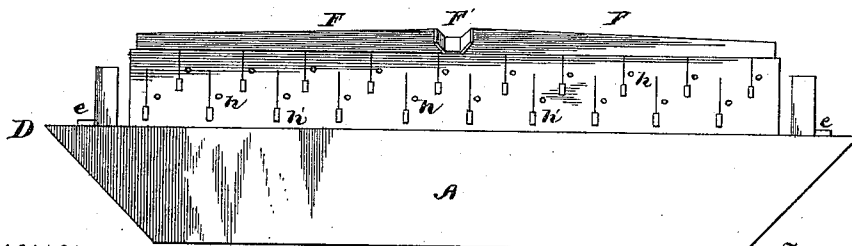
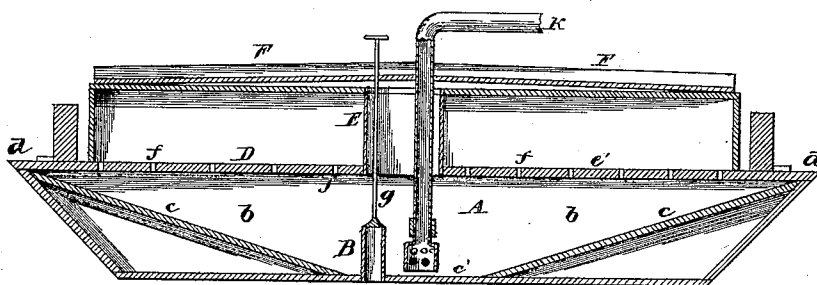


Fig 4.

Witnesses
E. H. Berry,
J. L. Dyer

Inventor.
Alexander McDougall
by Geo. Wagner
Attorney.

UNITED STATES PATENT OFFICE.

ALEXANDER McDOUGALL, OF DULUTH, MINNESOTA.

METHOD OF TRANSPORTING SAND, &c.

SPECIFICATION forming part of Letters Patent No. 397,741, dated February 12, 1889.

Original application filed April 28, 1888, Serial No. 272,185. Divided and this application filed October 5, 1888. Serial No. 287,278. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER McDOUGALL, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in the Method of Transporting Sand, &c.; and I do hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

In this application, which is a division of application, Serial No. 272,185, filed April 28, 1888, I desire to describe and cover the method which can be advantageously employed in the apparatus described in said application, Serial No. 272,185.

The method which I have used experimentally with entire success, and which I believe to be novel, consists, in a general way, in raising the sand from the bottom of a river or harbor by a pump and discharging the same into a box upon the scow or barge, then in moving the scow or barge as nearly as possible to the desired place, then in dropping the sand into the hold of the scow, then in supplying to the sand a sufficient proportion of water, and then pumping the sand and water to the desired place of deposit.

The apparatus which I prefer to employ for the purpose of loading, transporting, and unloading, in conformity with my method, as above described, consists of a scow or barge constructed as will be hereinafter pointed out.

For the better understanding of this apparatus, reference should be had to the drawings, in which—

Figure 1 is a plan view of the scow; Fig. 2, a similar view with the deck removed; Fig. 3, a central vertical section of the entire scow, and Fig. 4 a side elevation of the same.

Similar letters denote corresponding parts in each figure.

The hull A of the scow is made in any usual or well-known manner, it being only essential that there should be two or more longitudinal, preferably water-tight, bulk-heads, *a a*, extending from end to end, and so arranged that two of such bulk-heads shall

have between them a compartment or space, *b*, which shall be nearly or quite central in the hull. The floors *c c* of the space are inclined toward the center of the scow, preferably stopping a little distance apart, and having a flat recess, *c'*, at the bottom, which may be the surface of the bottom of the scow. In this recess *c'*, and preferably near the end of it, is placed a pipe, B, the interior of which communicates with the water below the scow, and rises to a height, preferably, about half as high as one of the central bulk-heads. This pipe constitutes or serves to support a valve, which can be opened or closed from the top of the sand-box.

The sand-box C is secured to the top of the deck D of the scow in any strong and suitable manner, and is shorter than such deck, so as to leave sufficient clear space at each end for managing the scow, and a small space, *d' d'*, on either side for the same purpose. At either end space, *d*, also, are hatches *e*, opening into the hull at points other than the central space, *b*, for the purpose of entrance or for ventilation. This sand-box C is divided by a bulk-head, *e'*, extending from end to end of the box, and preferably inclined so as to be a little lower in the center than the sides of the box, and which is made water-tight. Near each side of such bulk-head are a series of holes, *f*, passing through the deck and communicating with the space *b*. These holes are conveniently closed by wooden plugs, which may be attached to the sides of such bulk-head by cords. On one side of the same bulk-head, and near the center of the same, a water-tight box, E, is placed, which extends about as high as the bulk-head and opens into the space *b* in the hull, and this box is preferably not larger in internal diameter than two feet in width by four in length. A rod, *g*, passes through this box for opening and closing the valve of the pipe B.

A trough, F, is preferably placed upon the top of the bulk-head *e*, inclining toward the center and having communicating cross-troughs F', each with suitable gates or openings; but these troughs can be dispensed with without serious inconvenience.

Numerous holes *h* pierce the sides of the sand-box, and are closed by wooden plugs *h'*, secured as above described.

A piece of the inlet-pipe of a sand-pump provided with a bent arm, *k*, is shown in position in the box E.

It is evident that the central bulk-head, *e*, may be dispensed with; but it is believed that such a change would not be advantageous, and that many changes might be made in the apparatus above described by me as preferable without departing from the spirit of my invention.

The manner of operation is as follows: The holes *f* in the deck and the valve G being closed, the scow is moved to the part of the river or harbor from the bottom of which the sand is to be removed. A sand-pump of any suitable construction, one of the centrifugal ones being preferred, carried on board of a suitable vessel by preference, being placed in proper position near the scow, sand is drawn up from the bottom and pumped into the sand-box B either by placing the end of the delivery-pipe of the pump in relation to some convenient part of the troughs F F, or by placing such delivery-pipe so as to discharge pretty nearly equally on each side of the central bulk-head. The sand and water thus pumped into the sand-box, usually in proportions about three-fourths of water to one-fourth of sand, are relieved and drained of water by the removal of a sufficient number of plugs to the holes *h*. This work of filling and draining is carried on until the sand-box is sufficiently full, and the scow is then moved as nearly as is possible and convenient to the place of deposit. The holes *h* are then closed and the holes *f* in the deck are opened, and the bent end of the sand-pump pipe is passed down through the box E to the recess *c'*. Water is then discharged on the sand in the sand-box, preferably by force-pumps or pumps mounted on the scow or dock, until it is sufficiently fluid to run down through the holes *f* into the compartment or space B, and by means of the inclines in the same is diverted toward the

center of the compartment and near the valve-pipe E. The sand thus deposited is not sufficiently fluid to be raised by the sand-pump, and therefore the valve G is opened and sufficient water is mingled with the sand in the vicinity of the pipe of the sand-pump, and the pump is put in operation, raising the sand and water out of the compartment or space B and discharging them through the discharge-pipe of the pump or through additional pipes to the place desired. After the sand begins to flow freely down the compartment B the sand-pump can begin to work, and both operations of filling and discharging said compartment go on at once.

I am aware that a method has been described of dumping dry sand, &c., into bins containing water and then pumping the sand and water against a screen so placed as to allow the water to pass over the vessel and the sand to slide down into the hold of the same, from which it was subsequently removed by mixing it with water and pumping it against another screen upon the land. I disclaim the invention of this method, which could not be used to advantage in the raising of sand from the bottom of rivers and harbors, transporting it to a distance, and then discharging it at the point desired; but

What I do claim as my invention is—

The method, substantially as described, for raising, transporting, and delivering sand, which consists in pumping the same from the bottom of a river or harbor upon the deck of a scow, transporting the same in such position to the place of discharge, dropping the same into the hold of the scow or barge, diluting with water, and pumping the sand and water out of the hold through a pipe to the place of discharge.

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

ALEXANDER McDOUGALL.

Witnesses:

E. R. BRACE,

FRANK B. LAZIER.